

Pakistani Teens and Privacy - How Gender Disparities, Religion and Family Values Impact the Privacy Design Space

Maryam Mustafa
Computer Science, Lahore University
of Management Sciences
Pakistan
maryam_mustafa@lums.edu.pk

Abdul Moeed Asad
Purdue University
U.S.A
21100071@lums.edu.pk

Shehrbano Hassan
Digital Rights Foundation
Pakistan
shehrbanohassan@live.com

Urooj Haider
Computer Science, Lahore University
of Management Sciences
Pakistan
22100091@lums.edu.pk

Zainab Durrani
Digital Rights Foundation
Pakistan
zainab@digitalrightsfoundation.pk

Katharina Krombholz:
CISPA Helmholtz Center for
Information Security
Germany
krombholz@cispa.de

ABSTRACT

The understanding of how teenagers perceive, manage and perform privacy is less well-understood in spaces outside of Western, educated, industrialised, rich and democratic countries.

To fill this gap we interviewed 30 teens to investigate the privacy perceptions, practices, and experienced digital harms of young people in Pakistan, a particularly interesting context as privacy in this context is not seen as an individual right or performed within an individualistic framework but instead is influenced by a combination of factors including social norms, family dynamics and religious beliefs.

Based on our findings, we developed four personas to systematize the needs and values of this specific population and then conducted focus groups with co-design activities to further explore privacy conflicts. Among other things that confirm and extend existing theories on teen's privacy practices and perceptions, our findings suggest that young women are disproportionately impacted by privacy violations and the harms extend beyond themselves to include their families.

CCS CONCEPTS

• **Security and privacy** → **Human and societal aspects of security and privacy.**

KEYWORDS

privacy, adolescents

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1 INTRODUCTION

Research shows that adolescents are going online at increasingly younger ages [24, 64] and as a consequence are exposed to online harms and privacy breaches at younger ages. Additionally, a lack of technical, critical and social skills (e.g. ability to deal with cruelty, meanness and peer pressure in online spaces) often put young people at a greater risk of experiencing harms online [35]. While in recent years a great deal of research has focused on investigating teens privacy perceptions [13, 17, 26, 64, 71] much of this work has focused on WEIRD (western, educated, industrialized, rich and democratic) populations.

While there is a growing body of work that explores the digital security and privacy experiences of adult users that do not belong to WEIRD populations [55–57], the privacy behaviours and perceptions of adolescents in the Global South are under-explored and under-represented. To fill this gap, we followed an inducted approach and conducted qualitative interviews with 30 and focus groups with 15 Pakistani adolescents between the ages of 13 to 19 to explore experienced privacy harms, perceptions and practices. Pakistan is particularly interesting in that it is one of five countries with the largest population in the world and the largest percentage of it's population consists young people [23]. Currently, 64% of the population is younger than 30, 29% of Pakistanis are between 15 and 29 and this number is expected to continue to increase until at least 2050 [5]. It is therefore increasingly important to understand the privacy needs, behaviours and aspirations of this large number of users with hyper internet penetration, and increased and varied online activities [30]. The Pakistani context and the relationships young people have with parents is also interesting in that Pakistan is a religious, conservative, predominantly Muslim context with parental restrictions on dating, the free mixing of genders, exploring gender identities and an emphasis on family respect and honour [59].

Our findings reveal specific privacy harms experienced by participants online and the deeply gendered impact of these harms. In the

conservative context of Pakistan, our data reveals the severe and often collective consequences female participants and their families face in terms of reputational harm, feelings of shame and loss of social standing if female users are seen to engage online in ways considered culturally unacceptable. In contrast, male participants do not experience similar consequences and do not face direct material harms like loss of access to digital spaces. Similarly, we find participants experience conflicting and varied pressures of societal, parental, religious and peer expectations of online behaviours and their digital identities, forcing them to adopt complex mechanisms like multiple accounts, limited lists, self-censorship amongst others to carve out independent digital spaces for themselves.

It is in this complex context that we seek to analyse the privacy perceptions, harms as a result of privacy breaches and privacy preserving behaviours of teens. We situate our findings in the *privacy as vulnerability* framework [44] and highlight the challenges in analysing the privacy practices of our participants from the lens of a *contextual integrity framework* [48]. Nissenbaum's theory of contextual integrity [48], is based on the appropriate flow of information. The propriety of an informational flow is decided based on context. If in that transfer of information there is a breach in cultural, ethical or moral norms then it is considered a breach in privacy. While it is important to understand the norms when designing for privacy, McDonald and Forte emphasize the shortcomings of exclusively depending on norms as an analytical instrument [44]. Centering the norms ignores the privacy concerns of vulnerable populations who are not the dominant class/gender/ethnicity in *determining the norms* but are often forced to visibly perform them in online spaces. This is particularly true in contexts with significant power differentials like Pakistan where class, gender and parental influence play a significant role. Our work therefore, explores the following RQs:

- (1) What are the risks, harms and privacy perceptions of teenagers in religious, conservative Pakistan?
- (2) How do young people navigate online harms and protect themselves in digital spaces?
- (3) How might we think about privacy design in non-WEIRD cultural contexts to protect young people?

2 RELATED WORK

In this section we map out some of the most relevant existing literature on privacy perceptions, practices, and harms. In highlighting this work, we aim to build on it, identify the unique constraints and vulnerabilities of young people in the Pakistani context.

We first detail and highlight the unique constraints and cultural context of Pakistan that might impact young people's privacy beliefs and behaviors (Section 2.1), followed by summarising prior work on young people's privacy experiences and coping mechanisms (Section 2.2), gendered privacy (Section 2.3) and religious values and privacy (Section 2.4). Our literature review focuses on gender and religion as these emerge as the dominant values in the Pakistani social context, influencing perceptions, behaviors, and societal norms [20].

2.1 Cultural Context

Pakistan is deeply religious, conservative, and patriarchal, operating primarily on notions of community, family honour and piety [20]. Islamic principles and customs are deeply influential to social, legal, and political practices in both urban and rural areas. Islam is the state religion, with approximately 95-98 percent of people identifying as Muslim. Patriarchy is also deep rooted within Pakistan, with women regularly facing discrimination, inequality, exploitation, harassment, and violence in their daily lives. Pakistan ranks 153 out of 156 countries in terms of gender parity in economic participation and opportunity, educational attainment, health, and survival and finally, political empowerment [61]. Gender segregation is commonly imposed in public spaces to prevent interaction between men and women. The Pakistani social context revolves around family and community [38]. Loss of honour is a great source of shame, resulting in social ostracization and economic deprivation of entire families [45].

2.2 Young people and Privacy

In recent years, the number of children using digital devices, such as smartphones and tablets, at an early age has grown exponentially [24]. Prior work reveals that young people can articulate privacy risks such as oversharing or revealing personal identities that relate to their own person but are less aware of more abstract risks such as tracking, promotions or surveillance [50, 65, 75]. Factors contributing to teens privacy practices are friends' privacy settings, type of contacts, specific privacy concerns, past experiences and the presence of parental restrictions or surveillance. Studies suggest that teenagers may be uniquely prone to (and willing to) engaging in risky behaviours on social media [27, 47]. This suggests that while young people are deeply influenced by social relations and context to engage in specific privacy ensuring behaviours, their social environment also influences their chances of engaging negatively with the online space. Privacy, therefore, is configured by social relations and context, making it a social norm that dictates practice in different ways.

Teens who use social networking sites like Instagram, Facebook, Twitter, and Snapchat are also at an increased risk of potential harms like information leakages [36], sexual solicitations [53], cyber-bullying [28] and exposure to pornography, violence or other explicit content [37]. One study exploring experiences of teens reported 207 separate risk events including information breaches, online harassment, sexual solicitations, and exposure to explicit content [72]. Other work also highlights several variables in young people's internet use including the risk of cyberbullying, online abuse, and access to negative content [70]. Much of this research on categorizing the online *risks* the teens face, their coping strategies, their experiences and understanding of *harm* and their privacy preserving strategies are with participants from either the US or the EU. There is little data that can help us as privacy researchers understand how online *harms* and *risks* are understood and experienced by teens outside of the Global North and how might we design better technologies to protect and empower diverse populations of young people.

2.2.1 Privacy in the Global South. While there are a few studies that have expanded the scope of privacy research beyond the Global

North, they have predominantly been with adults [12, 56, 57]. How privacy is perceived and enacted has been understood by HCI researchers to vary across cultures. For example Vashistha et al’s analyses of 114 publications on privacy and security reveals culture, knowledge gaps, unintended technology use, context, and usability and cost considerations as primary factors shaping security and privacy preferences of people in developing regions like Pakistan [67]. Our own work focuses on context and culture to reveal privacy behaviours of adolescents. Specifically, in our work we reveal how patriarchal, collectivist, religious and conservative structures influence how adolescence perceive and manage privacy in Pakistan. Prior work in South Asia has highlighted the nuanced differences in how privacy is often considered in collective terms encompassing the family or the community [34, 67].

2.3 Gendered Privacy

Most previous studies exploring privacy behaviours, perceptions and harms have focused predominantly on cis-women, often low-income and low-literate [7, 56]. Much of this work explores the ways and means women use to carve out privacy in new ways, particularly on shared or monitored phones [6, 29, 57]. In their cross-country analysis on specific gendered online risks, harms and abuse, Sambasivan et al. reveal that a majority of participants (out of 205) frequently experienced online harms such as cyberstalking, impersonating, leaking of information [56]. The consequences for women in this study including reputation damage and emotion, physical and sexual violence. Kovacs found that the fear of damaging ones reputation is a common factor in limiting gender-equitable participation in South Asia [33]. Our study also explores the gendered understanding of privacy but amongst teenagers in Pakistan. Unlike participants in previous studies based in South Asia, our participants must also navigate boundaries and expectations set by parents or extended family members, peer pressure and the expectations of creating specific digital personas and having a digital identity. While prior research reveals that women in South Asia engage in unique strategies to ensure their privacy in the context of gender inequalities and consequent surveillance by using app locks, private mode and technological avoidance [21, 29], there is little understanding of how teenagers (young men and women both) might also negotiate gender inequalities.

2.4 Religion and Privacy

Recent scholarship from Pakistan and Bangladesh has recognized religion in understanding sociocultural norms and values [2, 15, 51, 52]. In the context of the subcontinent, the concept of religious ‘piety’ is of particular importance as it informs key norms around privacy and surveillance for practicing Muslims. An important and sacred concept for Muslims in the region is that of the Purdah (or veil) for Muslims [51]. The Purdah is a religious and social practice that limits the interaction of men and women to select circumstances according to religious rules. It represents modesty and directs the social segregation of genders which often is also practiced in digital spaces.

Our work builds on this literature to understand the unique socio-cultural factors that impact young people’s privacy concerns

	Lahore	Bahawalpur	Karachi	Misc.
Gender	Female(14), Male(7)	Female(1), Male(1)	Female(2), Male(1)	Female(0), Male(4)
Age	Min:13, Avg:6	Min:15, Avg:15	Min:16, Avg:15	Min:14, Avg:16

Table 1: Demographics of 33 participants across different cities of Pakistan. Misc. refers to smaller cities.

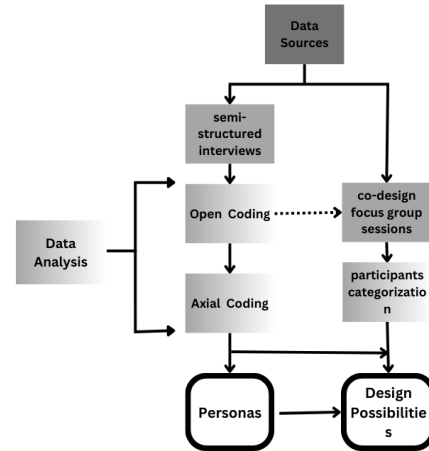


Figure 1: Methodology visualization highlighting the sources of data, analysis methods and outputs.

and behaviours in Pakistan. Young people’s mental models of technology and digital privacy are under-studied outside of the Global North. We fill this gap to explore the tensions young people in a restrictive context must navigate including but not limited to their religious beliefs, familial expectations and surveillance, broader societal expectations and peer pressure to maintain digital identities and navigate digital spaces safely but also freely. We focus particularly on highlighting the norms that determine participants behaviours along with context, relying on both the contextual integrity framework [48] where adequate protection for privacy is tied to norms of specific contexts, but also focusing on vulnerabilities and highlighting the power differentials in the setting of norms that impact our participants [44].

3 METHODOLOGY

We conducted 30 interviews with teenagers over the course of a year in Pakistan (Table.1) and focus group discussions (FGDs) with 15 teenagers across four sessions. Semi-structured interviews followed a short pre-screening survey (Table.1), were chosen to unpack detailed experiences and stories of privacy violations, harms, behaviours and fears (Table. 1). In particular, due to the sensitive nature of some experiences of harm we wanted to build rapport with participants, to ensure they feel safe, are comfortable and can then share valuable experiences with us of their experiences of privacy

harms, fears, mitigating behaviours and concerns. To respect cultural norms and establish participant comfort, all male participants were interviewed by male researchers and female participants by female researchers.

The focus group discussions were also conducted over zoom and involved activities designed to help us better crystallize and understand user-centered design for privacy and security in non-WEIRD context's and with/for young people. These sessions helped elicit user privacy aspirations and conceptual ideas but also helped us explore salient characteristics of our persona's (Table.2 that lead to specific behaviours. Participatory design approaches to understanding user-centered privacy and security design have recently been used to explore and scope the design space for usable security [16].

All activities were done remotely over zoom because of the global pandemic to comply with regulations at the time and for the sake of safety of the researchers and participants.

3.1 Recruitment

Our work is in collaboration with a non-profit advocacy and digital rights organization (Digital Rights Foundation, DRF) focusing on ICTs to support human rights, democratic processes and social justice in Pakistan. DRF has a significant presence in the field and led the data collection process. Participants were recruited through their networks and online student communities (Facebook, Twitter and Instagram). In an effort to balance the gender of our participants, we randomly contacted an equal number of male and female participants from the 71 responses to our call for participation. We conducted a total of 30 (13 M, 17 F) interviews¹. To be included in our research, participants had to be teenagers i.e. between the ages of 13 and 19. IRB approval from the University review board was obtained for this study and parental consent was obtained for all participants below 18 years of age, while participants above 18 consented themselves. The participants were compensated with PKR 1500 (a little over USD \$9) for their time. The incentives were ethically determined through our community organization partner that has experience and specializes in working with our target populations to ensure compensation was not perceived as coercive or inappropriate.

3.2 Interview Protocol

Our interview protocol explored interpersonal privacy and safety concerns, perceived risks, experienced harms, online fears and mechanisms to enact safe spaces, boundaries and navigate online spaces by teens in our context (see appendix). Our interview protocol was based on the sixteen privacy concerns explored in earlier work [22] based on data gathered from 10 developed and emerging economies. These sixteen concerns broadly related to 1) Concerns about actions that other people might take toward someone in the app, (2) concerns related to how apps are seen to collect and use data, and (3) concerns related to who has access to information the app is seen to know about people. These concerns and broader categories helped us craft questions for our interview protocol (Appendix 7.1).

¹No participant identified as non-binary at any stage of the study. We asked participants twice, during the initial call and later in the interviews

We opened each interview with open-ended questions about participants' conception of privacy and provided them with no prior definition of privacy. Each interview was conducted over zoom and we acquired parental or participant consent prior to the interview with a consent form, participants were also asked to consent to the recording and use of the data at the start of each interview. The mean time for the 30 interviews was 48 minutes (median 47 minutes) and the interview time ranged between 20 minutes to 1 hr and 28 minutes. Interviews were conducted in a mix of Urdu (local language) and English (participants were educated and comfortable in speaking both languages). It is very common in Pakistan that Urdu and English are mixed. We continued to interview until saturation was reached i.e. no new insights, experiences, harms emerged leading to a total of 30 interviews.

3.3 Focus Group Discussion

The focus groups followed the interviews and were designed to explore actual behaviours while the interviews focused on experienced harms, privacy perceptions and beliefs. Focus group discussions happened within three months of the semi-structured interviews. 15 participants aged between 14 and 19 participated in the discussion. The focus groups were action oriented with participants performing specific tasks. Task 1 focused on privacy concerns on social media while Task 2 focused on posting behaviours of personas (for details please see Appendix 7.2). Data from the semi-structured interviews was used to create the personas and the focus groups tasks validated these personas by asking participants to predict posting behaviours based on presented persona's (Co-Design session Protocol in Appendix). Our personas were made to capture the diversity of personality traits of participants from our interviews. All interviews and focus group sessions were conducted on Zoom and the focus group activities were done using figjam, an online collaborative digital whiteboard. The ideas were generated as digital 'sticky-notes' or cards (we will be referring to these artefacts as digital sticky-notes or cards interchangeably through out this paper), and were preserved as design artefacts for analysis in this study.

In keeping with cultural norms and in an effort to produce a safe space for participants, the workshops were gender separated; we had two focus group sessions for boys and two for girls with a total of four sessions. An FGD was conducted over a single day and the sessions were recorded with the consent of the participants. The activities were conducted using figjam, an online collaborative digital whiteboard and zoom, an internet conferencing tool for sharing video and voice.

Before the FGDs, participants were emailed what they would be doing at the session and at the start of each discussion participants were briefed on the structure of the study and had concerns addressed by the second (for male groups) or the fourth author (for female groups). To get comfortable with the other participants and get accustomed to the white-boarding software, the sessions started with a ice breaking activity. We conducted two major activities to understand factors mediating disclosure among teens and the associated perceived privacy risks with social networking sites (SNS). In both activities we used card sorting led by the participants to

avoid assigning judgement-laden labels ourselves when drawing conclusions from the design artefacts.

The data generated needed minimal processing because the data was categorized during the activity by the participants.

3.4 Data Analysis

All interviews were translated into English in transcription and in combination with the transcripts, low inference notes were taken during the interviews for the researchers to reference during the analysis process. The transcripts were subsequently analyzed using open coding as described by Strauss and Corbin [63]. Two authors coded the raw data [54], one male and one female, both of whom are computer scientists and Pakistani. These were then reviewed by a third author also a computer scientist and Pakistani. Discrepancies were resolved and the data was iteratively coded. We focused on access, number of devices, number of years of usage, privacy behaviours, threats and experienced harms, privacy knowledge and fears. The three authors then collectively grouped the codes into categories (axial coding, also following the approach by Strauss and Corbin) [68] together under key themes (see full interview protocol in appendix) and constructed personas. The resulting codebook revealed themes like privacy importance, social media usage, online harassment, privacy violations, privacy definition etc. Details can be seen in the code book presented in Appendix 7.3.

For our FGDs, we used card sorting and the categorization made by the participants. To make sense of themes across sessions, we interpreted similarly labeled themes as part of the same idea. Such categorizations include 'personal development' and 'learning' or 'news' and 'updates'. We then counted the frequency within each category and further analysis was informed by our framework developed after the thematic analysis of the in-depth interviews.

4 FINDINGS

We present key findings from our qualitative interviews organizing them under three main themes: 1) Privacy Perceptions and experienced harms, 2) Key constructs impacting privacy, and 3) privacy practices to navigate 2. We also briefly discuss participants aspirations and desires with respect to privacy features (see appendix for codebook).

4.1 Privacy Perceptions and Experienced Harms

To understand the privacy perceptions of our teenagers we asked them what 'privacy' meant to them. The code book revealed participants framed privacy by referring to their personal beliefs and real life experiences. When asked what they thought privacy was, many drew parallels to their offline lives, referencing enclosed physical spaces and physical solitude where the presence of any person across a certain personal boundary without consent counts as intrusion and a breach of privacy.

Privacy in the physical space is of particular importance in our context given that often in Pakistan large extended families live together and privacy is thought of in collective terms and not individually. [67]. For our participants, privacy meant having a personal inner space free from intrusion from their parents or peers. They were cognizant of who might access their sensitive information such as personal photos, conversations or location. Our data reveals

that young people think of privacy within an individual framework. This is also different from prior work in the Global South where most adults conceive of privacy as a collective and not an individual right [58]. Mentally, they perceive privacy as something that can be achieved beyond family or social structures to only be about them as individuals. However, our findings reveal that while this maybe the desire and mental model of young people, their concerns determine their *practice* of privacy to be centred on the collective, specifically their family. Participants, when asked to explain what they would not be comfortable sharing online, often included their family members into that sacred space of protection and security along with their individual content.

Similarly, while female participants revealed family restrictions on their usage, they still conformed to the accepted privacy *norms* where family is considered within the private sphere. This finding aligns with cultural expectations in Pakistan, where individualism within a family is often considered offensive and familial relations form the basis of a person's identity [38].

4.1.1 Privacy Harms. To understand what are considered privacy violations for teens, we asked participants to share their experiences, who shared, heard or experienced privacy violations. Participants also discussed their fears/concerns with respect to digital privacy violations. The specified violations varied in severity for male and female participants. These included but were not limited to identity theft, leaked personal chats, unwanted direct messages, non-consensual addition to online social groups, tags by random profiles on inappropriate content, non-consensual use of pictures, blackmail and threats to leak specific images (see appendix).

This is different from the experiences of adult low-literate users in the Global South as reported in earlier studies where identity theft, leaked personal photos and non-consensual addition to groups has not been reported as privacy breaches or harms [51, 56]. This is partly also because older users are less frequent users of social networking sites and hesitant users.

Leaked photos: One the most pressing concerns discussed by participants was their personal information being leaked by someone. This was also the most frequently experienced privacy violation amongst the participants. For young girls, leaked photos or communication was identified as a significant harm. They used words such as 'traumatised', 'depressed', 'devastated' and 'violated' to illustrate their experiences of leaks, highlighting an element of shame associated with having their pictures or messages leaked on social media.

One female participant revealed that the sharing of someone's address online is one of the worst privacy violations followed by the sharing of pictures: *"If it's about address then it's very very bad and it can be very harmful and if it's about pictures that too is just invading someone's privacy."*-F12

In particular, the sanctity of the body and its violation was an extreme harm experienced predominantly by female participants. Young girls particular considered their body as absolutely private. This was expressed by F10, who was asked what she would never share in online spaces: *"My body. My naked body, I'm not okay with that."*

In contrast to other contexts, in Pakistan, the shame of leaked content is not a burden carried solely by the individual but is shared

by the individual's family and community. Honour and chastity are integral to gender relations in Pakistan. Those who value honour are not only concerned with attaining and maintaining it but also avoiding the shame associated with its loss [66]. F8 talked about the societal and familial backlash that females would likely encounter highlighting the gendered differences: *"If a girl gets her photo leaked and if a boy gets leaked, people will talk more about the girl, the girl will get hurt more you know the society we live in is very mean to women and obviously face more harassment so if you get a pic leaked nobody's gonna care if you're a boy but if you're a girl people are gonna comment on that picture, make negative comments, harass you, they're gonna think bad things about you."*

In the context of a deeply sensitive and embedded notion of purdah, if women are found to be engaging in activities beyond what is socially and culturally acceptable, it can have severe consequences for their reputation and their family's social standing. It can also lead to gender-based violence from within the family and beyond. In contrast, male participants when experiencing privacy violations and harms felt anger instead of the shame and trauma experienced by the female participants. Young men are also less likely to be held responsible for 'dis-honouring' the whole family or to suffer tangible harms in terms of loss of privileges (access to devices and online spaces), loss of mobility or ostracization within their social circles or families.

Leaked Chats and Screenshots: Another reported violation was the leaking of chats, where participants private chats were screenshot and shared with wider audiences. For male users, this concern amongst participants was largely motivated by the desire to contain adult content they were sharing or watching. We find that while honour does not play a pivotal role in privacy behaviours for young male users, shame is a salient feature as it concerns social stigma around the consumption of content that is considered taboo or obscene. This shame was reflected in the fears young people had about potential leaks and was largely related to their parents finding out about leaked content. A combination of social and cultural norms dictated by religious teachings around piety and purity can be seen as a driving force behind such shame. In situations where a leak had occurred, participants mentioned feeling insecure, depressed, and judged. One female participant shared that the leaking of her personal chats had a direct consequence on her social life, resulting in judgement from friends and a fear of sharing information and conversing online. As a consequence F2 now refrains from any controversial conversations online because the past experience have made her *cyber-paranoid* and she fears that someone might be reading her conversations.

Unsolicited Direct Messages: Participants narrated experiences of strangers sending them inappropriate content in direct messages on SNS (Social Networking Sites), while other participants shared the fear of this happening to them. Female teens viewed receiving unwanted messages as a form of privacy violation and a direct harm, compared to relatively fewer male participants. Female participants also recalled instances of harassment and receiving unsolicited pornographic material. There was a clear sexual nature to the unwanted attention, particularly the sharing of inappropriate content with them as minors, their lack of understanding of the potential harms and the consequences as a result of being exposed

to porn. For our female participants the most frequently experienced harm was constant harassment by older men through DMs and friend requests. Most female participants shared experiences of being forced to see pictures sent by a stranger despite warning them to stop. Some revealed being exposed to traumatic, inappropriate content as young as 12 years old: *"The earliest I remember I was like 12. Instagram bots that message users to promote products or whatever, but this bot was promoting like a porn link and, I was just 12 right? So it was like 'hey let's chat' and then this cherry emoji and I didn't know that that meant and there was a link. And so, they didn't show any picture like um you know you have to accept, decline or block. And before I couldn't see any picture, I could just see a link so I was like okay Accept. And as soon as I accepted, there was a really inappropriate picture and I got really scared. so then, I immediately blocked them and that was really traumatising."*-F14 In contrast to the harassment faced by female participants, male participants often mentioned receiving messages from spam accounts and bots. Those who received direct messages did not consider them harassment or a harm and instead ignored the requests and moved on. Similarly, when male participants were sent threatening messages they did not perceive them as particularly harmful. M6 reveals that he was blackmailed and threatened by a stranger who claimed to possess information about his family but blocking the resolved the problem.

This again, is deeply tied to the conservative patriarchal nature of Pakistani society where women, as bearers of their families' honour and reputation, feel a greater fear of unwanted communication as it can have unintended consequences including disrepute and shame.

Unauthorized Access to Personal Accounts: Participants revealed that they had faced situations where strangers had gained unauthorized access to their personal accounts. The hacking of an account was not specified as an isolated harm, but was discussed as particularly traumatising due to its effect on participants' social standing among peers. One participant revealed that he had learnt of his social media accounts being used to upload content from friends while another elaborated on the alarming nature of the hacking and the consequent embarrassment he felt at having to explain the breach to his friends. Participants had few avenues for retrieving or reporting hacked accounts, leading to fear of their private content being leaked as a result of the hack.

4.2 Key Constructs that Impact Privacy Practices

4.2.1 Family Expectations and Privacy. Participants reported joining social networking sites at an average of 11 years. Out of 30 participants (17F, 13M), 28 (15F, 13M) had a phone as a personal device with internet connectivity. 2 female participants didn't have phones but had a laptop with internet access, 20 participants also had a laptop, and 9 had either a tablet or iPad (shared access to some devices). In order to understand the impacts of familial expectations and boundaries on teen's privacy behaviours, we asked participants about their family structure and values (i.e whether they considered themselves to be part of conservative, liberal or mixed households). This is an important factor in the Pakistani context to help us understand the constraints teens might face in maintaining private digital lives and to understand their perceptions of 'private'.

Most of the participants in the study lived in a nuclear family which included their siblings, and parents (from the pre-screening survey, please see appendix). 2 female participants shared that they live in a joint family with extended family members including uncles, aunts and grandparents.

Participants shared that they had liberal leaning families but also further revealed the expectation of gender segregation by their families. They faced restrictions on interacting with the opposite gender online but the participants found these restrictions normal and still thought of their families as liberal. 8 participants (3F,5M) belonged to conservative families and faced certain restrictions set by their parents.

Conservatism often manifests through parental restrictions on children, moral policing, and gender segregation. Our participants had an over-riding concern and fear of the expectations of their families. They were less concerned about what they as individuals want and more about what is expected of them from their families. For example, many participants discussed fears of their parents finding out about their online activities or their families misunderstanding their actions online. Most of these fears are linked the performance of 'piety'; of their actions being seen by family as 'immodest'. One of the major themes is familial expectations of gender segregation online. Both male and female respondents were not allowed to interact with the opposite gender online. This is particularly salient for female respondents who specifically mention their fears of being caught interacting with male users online. Those participants who did maintain online relationships kept them hidden from parents.

This suggests a performance of privacy that does not extend beyond familial and social bounds to be performed as an individual right. In our context we see privacy being enacted to uphold the social order. Female participants express concerns about sharing content that they feel might trigger male members of their families. For example, a participant revealed strategically curating her online experience to ensure gender segregation for her family's sake: *"Sometimes I ask my male friends to not tag me on Facebook or not comment on my pictures like posting emojis or something like that because I know they're my friends but my parents or my relatives won't understand so I stop them and sometimes, for LinkedIn you see everything the other person does, so sometimes I also feel - what will my father think that I'm liking more of guys posts so that scares me too."*-F4 In contrast, our male participants shared that teenagers watch adult web series and porn content online and also use abusive language in their direct messages (dm's) without the knowledge of their parents.

Young people in our sample are seen to constantly be negotiating the boundary between individuality and group privacy in an attempt to make online spaces their own without *being seen* to violate social norms or familial expectations of digital behaviours.

4.2.2 Religion and Privacy. Along with familial expectations, an important consideration when enacting and performing privacy in digital spaces for our participants were religious beliefs. Young female users, in particular, alluded to fears of moral policing in offline and online spaces [49]. Young girls are well aware of the unintended and real-world consequences of online social transgressions and the costs a breach in those religious norms carry for them.

This hyper awareness is reflected in the way young girls strategically filtered content to fit what was expected of them by their families, informed by religious Pakistani society. One participant stated that she limits her content to ensure not offending her male members of her family: *"There are posts like the Aurat march posts and I feel like the males of my family will get triggered and they will start an argument sort of a thing so I just avoid sharing that sort of stuff on Facebook."*-F4 Aurat (Women's) March is an annual women's rights demonstration by activists across major cities in Pakistan which has been subjected to heavy criticism in Pakistan for going against the dominant cultural values of Pakistani society [31]. Openly supporting Aurat March is therefore considered a controversial and potentially risky activity because of its assumed association with vulgarity, Western influences and ultimately, it's "un-Islamic" nature.

Religion is a deeply sensitive issue in Pakistan; one that is emphasized legally, institutionally and socially through strict rules around the virtue and chastity of women. Young girls fear judgement and consequently struggle to maintain a balance between an enjoyable yet religiously and morally policed online existence. This struggle is exemplified through the strategic filtering of judgemental family members or ensuring that content that could offend religious sentiments remains hidden constantly navigating 'privacy' through a religious and moral lens. Content and activities that do not fit with their or their families beliefs is often how 'privacy' is defined and understood. In contrast male participants were less concerned about offending family members and less fearful of offline repercussions. Instead their concerns were more focused on familial expectations of online behaviors and personas.

Digital Purdah: Our findings reveal that gender segregated spaces are frequently used to share content online and to enact a digital form of Purdah as it exists offline. In particular, almost all male participants said they were part of some closed gender-specific group, while 9 women elaborated on using gender segregated spaces such as private group chats or closed groups. Another 9 female participants emphasized specific boundaries of information disclosure online, where they believed that posts or pictures they share should only be available to a female-only audience. Female participants' reasons for using gender segregated groups ranged from fear of misuse by a wider audience to feeling a sense of safety with other females. Most of our female participants relied on gender segregated digital spaces to share their content, including ensuring the absence of male friends from their digital profiles. Female participants shared that they are part of such groups to share their pictures or videos with female friends only because this preserves their privacy. They believed that their information is safe with other women: *"I make a lot of crazy videos too that are like very personal to me so I would not like my male friends to ever see that."* F1

Female users actively work to ensure there is segregation between genders as part of their privacy strategy. In particular, they hide their stories as well as discourage their male friends from commenting or tagging them in photos. The rigidity of this structure was exemplified by a male participant who explained how transgressing a gender boundary he was unaware of led to serious consequences for him when he 'liked' three pictures on a female coach's Instagram. The first transgression was the 'liking' of the female coach's photo and secondly, repeating this act another two

times. Gender segregation is a central component of Pakistani society, where the seclusion of women from public spaces is pivotal to the maintenance of family honour. As such, most events such as weddings, funerals and religious gatherings in Pakistan remain gender segregated in order to maintain this social norm. Though Western scholarship has often depicted the purdah as a patriarchal instrument to impose gender inequality [3], scholarship from Muslim Feminist scholars suggests that the Purdah also provides women with a level of privacy which promotes their social participation and mobility [3, 14, 51]. Placed into online spaces, this 'digital purdah' is also deeply embedded in young teenagers' fears regarding privacy and their privacy practices.

4.2.3 Gendered Privacy Behaviours. Female participants experienced gendered violence in online spaces and were more cautious online users, acutely aware of their own vulnerability with regards to privacy and operating online with discretion and a heightened awareness of risks involved. Female participants adopted strategies beyond platform affordances to vet any potential friends or followers online. They only allowed online connections with users who they had met physically or had mutual friends with. Female users leverage offline networks and connections to verify "safe" virtual connections: *"I do have a criteria for who I accept. I accept requests from people I know, its best if I've met them but its okay if I know them through other people."*-F8

Additionally, female users rely on each other to ensure safety online. In contrast to perceiving themselves as exercising individual privacy, young female teens, given their added vulnerability, carve out collective vetting procedures for themselves. In particular, participants use mutual friends and female siblings to verify whether other users are safe to add to their networks. This finding aligns with Marwick and boyd's notion of "networked privacy", where a collection of social norms, audience perception and factors affecting concealment and disclosure force individuals into new networks to maintain privacy" [41]. For young female users, it is vital to establish a safe network to screen others before allowing them into their private spaces. Our findings suggest that female users create an additional boundary one step prior to information disclosure by engaging with other female users to create boundaries around their usage to ensure information does not flow out or is exposed to the wrong audience.

4.2.4 Privacy Practices to Navigate Norms. Here we list some of the most commonly used privacy features amongst our populations to ensure privacy of their data but also to ensure online safety.

Limited Lists. Most of our participants maintained different lists to separate out friends, family and acquaintances for tiered access to content. They used 'close friends' lists and posted stories and content only to those lists to separate out other audiences. The most popular platform in use is Instagram with its close friends story feature. Participants also use WhatsApp status where they can tailor settings and select a specific list of people who can see their stories.

Participants also use custom lists across Instagram and Snapchat and tailor different types of content across different types of audiences. For example, M11 has set up complex mechanisms across two platforms (Instagram and Snapchat) where on one platform (Snapchat) he has a permanent list of friends but Instagram allows

him the flexibility to hide his stories from specific audiences. The hide stories feature was frequently used by participants who lived in combined family setups and needed to ensure digital privacy of their physical activities.

Multiple Accounts. Participants also relied on using multiple accounts which they referred to as 'spam accounts' or 'finstas' where they had limited connections. These accounts were used as free, open spaces where they could post whatever they wanted as they considered those accounts as 'un-watched' spaces with only trustworthy friends. F5 said she maintains two accounts and has only very close friends in her spam account whereas her main account can be accessed by a larger audience.

Only one participant discussed using an applock for additional privacy on their phone to secure their social media apps. This was not a common privacy preserving practice amongst our participants.

4.3 Personas

We generate personas (Table 2) from axial coding our interview data. These personas have been designed to highlight situations, contexts, expectations and behaviors that arise in young people's lives in Pakistan and by doing so, help designers to validate their privacy concepts towards this specific population. Our personas were made to capture the diversity of personality traits of participants from our interviews. We made our personas based on the lived experiences, challenges and needs of users within our study. We found of particular importance in developing our personas was the degree with which each persona feels free to express themselves online. Our interview data reveals how self-expression online is informed by (male) privilege, family honor, and religious and familial norms. This was further corroborated by posting behaviour during the focus group activities. Although the personas in themselves are helpful to communicate and empathize when designing products [43], we also use our personas in our focus group co-design sessions to systematize posting behaviour on a spectrum of different privacy preference.

Our personas were made to capture the diversity of personality traits of participants from our interviews. We found of particular importance in developing our personas was the degree with which each persona feels free to express themselves online. Our interview data reveals how self-expression online is informed by (male) privilege, family honor, and religious and familial norms. In order of freedom, our personas are: *Nauman* (most free), *Sara*, *Farhan* and *Khadija* (most restricted).

4.4 Focus Group Discussion and Activities

The Focus group discussions were based on personas created through the semi-structured interviews and were designed to explore actual behaviours while the interviews focused on experienced harms, privacy perceptions and beliefs. The focus groups were action oriented with participants performing specific tasks. The interview data was further corroborated by posting behaviour during the focus group activities.

In the analysis of our sessions, we use the frequency of an issue across sessions to understand its priority. Additionally, since our discussions were gender separated we report insights disaggregated by gender.

Persona	Description
Nauman (M), 17 Lahore, Pakistan	<p>Nauman wants to be a popular person at his school and enjoys the attention he gets from social media. He often participates in internet challenges and makes funny content with his friends that he posts on his public Instagram account. He has many friends from his school and is seen hanging out with 'his boys' and occasionally some girls though he goes to an all-boys school. He posts about his hangouts on Instagram, which has a sizable following. He sometimes posts things because he feels like he has to post every month or people may stop following him. Nauman has had mental health challenges since he was 10, around the age he joined social media. He sometimes feels a bit hopeless when it comes to his studies but is currently feeling okay. He often does things that his friends ask him to, which causes him to reduce his studying time. He is under pressure to do well in his studies because his sister is studying abroad in a prestigious university.</p>
Sara (F), 16 Islamabad, Pakistan	<p>Sara lives in a nuclear household with her mother, father and one older sister. Their house is located in Bahria Town, Islamabad [expensive, gated community]. Her father is a businessman, and her mother runs a non-government organization. Sara has a personal phone (an iPhone 11) and MacBook to use for school and other activities. She has accounts on Instagram, Snapchat, Twitter and uses Facebook rarely. She has a public account on Instagram and a private "finsta" account for her close friends.</p> <p>Though she goes to an all-girls private school, Sara's best friends' group includes two girls and two boys who she met online through a group chat. She is popular in school and frequently takes part in the Drama Club and Musical nights. She feels that Instagram helps her meet new people with interests similar to hers. However, Sara became a little scared of social media a page called "Lahore Confessions" on Instagram started posting false gossip about her and her friends. She reported the account but has felt a little unsafe since then.</p>
Farhan (M), 14 Hyderabad, Pakistan	<p>Farhan comes from a religious family and has been on social media for 3 years now with parental supervision. He joined Instagram because many of the popular kids were on it and he did not want to miss out. He is allowed to have a phone, unlike his 2 sisters, even though one of his sisters is 2 years older than him (his other sister is 3 years younger).</p> <p>Farhan is a studious member at his school, and tries to participate at school assemblies and other important academic events such as science competitions. He's not always invited to parties and seeing photos of his schoolmates doing things without him affects his confidence. He feels a lot of stress because he is picked on by some of his classmates. He cares a lot about feeling safe online and wants to be in control of who can see his content. He is so vigilant of his privacy and does not post a lot of identifying information e.g. he keeps his location services turned off.</p> <p>However, he wants to fit in with his class members so he is following a few of his friends and has a few of them following him on Instagram. However, his family is also on his social media accounts.</p>
Khadija (F), 15 Lahore, Pakistan	<p>Khadija lives in the upper portion of a house in Dharampura [lower-middle class neighborhood]. She is a middle child, with one younger brother and an older brother. The bottom portion of the house is occupied by her grandparents and uncle. Khadija's father is a police officer, and her mother is a housewife. She shares a bedroom with her younger brother. She also shares her laptop with him but has a personal phone on which she uses social media. She is not allowed to have Facebook or Snapchat but has one private account on Instagram.</p> <p>Khadija is a high achiever in her school. She regularly takes part in competitions and is well liked by her teachers. However, in school she struggles to make friends and is often bullied by the popular girls in school. She has a few friends but only talks to them in school and does not visit them outside school. On Instagram, Khadija does not accept any follower requests from boys and follows her mother and older brother on the app. She often feels like if she had more freedom, she would want to post pictures of herself but is scared of being judged and bullied by others.</p>

Table 2: Personas of young people after our interviews.

In the first activity participants were asked to brainstorm and sort the reasons to first use social media (*task 1*), and then their privacy concerns (*task 1*). In activity two, participants were asked to construct and label an image board for an assigned persona. All category names were made by participants, though some category

names have been edited for clarity. The summary of frequencies can be seen in tables 3, 4, and 5 in Appendix.

4.4.1 Task 1 - Reasons for Using Social Networking Sites. It was important to understand the incentive participants had to use social media in order to address the conditions which lead to the creation of the privacy paradox [8]. The privacy paradox is the phenomenon

Table 3: Top Privacy Concerns on Social Media by number of cards in category (Total 148 notes)

Overall	Female	Male
Platform security and safety (33%)	Creepy behaviour (53%)	Platform security and safety (38%)
Creepy behaviour (29%)	Platform security and safety (30%)	Personal secrets (16%)
Personal secrets (12%)	Personal secrets (9%)	Data collection (13%)
Data collection (7%)	Data collection (3%)	Reputation (%10)

Overall	Female	Male
Communication or networking (25%)	Entertainment (22%)	Communication or networking (37%)
Entertainment (23%)	Communication or networking (20%)	Entertainment (25%)
News or information (16%)	Personal development or learning (18%)	News or information (25%)
Personal development or learning (13%)	News or information (17%)	Business/Marketing (%14)
Activism or social work (6%)	Activism or social work (7%)	Personal development or learning (6%)
Academic or career (4%)	Academic or career (6%)	Activism or social work (6%)

Table 4: Top reasons to use social media by number of cards in category (Total notes 186)

associated with discrepancies observed between participants’ privacy attitudes and their actual behaviour. In a recent paper Westin and Chiasson [69], explain the paradox as a systematic way of manipulating users into making privacy compromising decisions based on dark design patterns [10]. They propose *FoMO-Centric Design*, a framework to understand such behaviour. FoMO is the *Fear of Missing Out* or a pervasive feeling of missing out on rewarding experiences that others are having [19, 69]. Younger people are the most likely demographic to relate to feelings of FoMO [1], and FoMO has been linked to as a predictor of problematic social media use [19]. Across our sessions we saw students participating in social media because they wanted to stay informed of what was happening in the lives of their friends and “to keep updated regarding trends” (Session 2).

We found that the most mentioned use of social media was to *communicate or network* with individuals and groups. Reasons to communicate ranged from all encompassing statements such as "Being bored in the summer and wanting to keep up with whats going on" (session 1) to discussing products or the news with friends. The prevalent theme of this category was the need to keep up with what their friends were up to. The second most popular reason



Figure 2: As part of activity 1, every participant (each had a different color) from our second girls session had concerns about location tracking, titling the subcategory ‘life in danger’.

to use social media was for *entertainment*. This category included consumption of various types of media such as ‘swiping through memes’(session 4), ‘watching (their) favourite youtubers’(session 2), and ‘to read true crime cases’(session 2). The category also included platform specific features such as using ‘snapchat for selfies and filters’ (session 3) and ‘to word vomit on twitter’ (session 3).

The *news* category had mostly to do with keeping up with music, celebrities, world events and political commentary. In our second session female participants emphasized ‘for social change’ as a sub category of news. They saw the role of social media as an advocacy tool for women and minority groups; one card read ‘(I use social media) to talk about issues that are ruining society like rape cases in Pakistan and the terrible situation in Palestine’ (session 3). Our qualitative interviews also revealed the importance female participants placed on creating digital safe spaces, using novel strategies for protection and prevention and being hyper aware of privacy and safety issues concerning women.

The popularity of the top three categories - which account for more than 60% of all cards - can be explained by FoMO i.e. the participants desire to ‘stay in the loop’ or else feel left out of current trends and life updates of their friends. All three categories are time bound. Delays in responding to someones birthday, a news event, or a trend can seem like missing out which is in line with FoMO-Centric Design [69]. Beyond the top three categories teens also mentioned using social media for *personal development*. In this category, participants wrote about using social media to get inspiration for their talents (e.g. cooking, arts and crafts), to find motivation (by ‘reading testimonials ... on reddit’ (session 3)) and for their religious study (‘listen *naats* (Islamic religious hymns)’). Other categories that participants made included *academic or career oriented use, activism, shopping, business, and content creation* in that order.

4.4.2 Task 1 - Privacy concerns on social media. The privacy concerns that we identify in this task extend our findings beyond our thematic analysis in section 4.2.3. A theme that was noticeably absent for male users but was the overwhelming concern for female users was *creepy behaviours*. In fact, about half of all cards produced during the activities in the female session dealt with *creepy behaviours*. Our findings are in-line with the literature on South Asian gendered digital violence particularly as identified by Sambasivan et al who in a study with South Asian women identified cyberstalking, impersonation, and personal content leakages [56] as key harms experienced online for women in the region. The category of *creepy behaviours* as identified by our participants was dominated with leakages of personal content, with many girls

afraid of someone getting access to contacts, personal chats, and social media accounts as a whole. Our female participants also frequently mentioned fears of cyberstalking in the form of “lewd and highly inappropriate messages on numerous platforms” (session 2), which escalated to issues of life and death as one teen mentioned “someone can easily locate where you’re at by your snapchat account especially and break into (their) house thru (sic) that info” (session 3) (also see fig 2). Instances of impersonation were linked with loss of reputation “someone can make a fake account by my name, acting as me but doing things i wouldn’t do.” (session 2). Additionally, in this category our female participants feared accounts of men impersonating as women trying to catfish them. While most of of Sambasivan et al’s work focuses on harms for women, our findings extent the work and points at gendered violence that starts for women at a younger age, when they are minors on SNSs.

In task 1 we saw *platform security and safety* to be the large concern for both boys and girls. The category included perceived vulnerability of platforms that might allow others to ‘hack’ or ‘peep’ into their account. This vulnerability was perceived as allowing bad actors to get a hold of a teens location or other sensitive data via a data breach of the platforms. One prevalent concern was the outing of personal chats. Other concerns included hacks that could enable access to device sensors such as a phone’s microphone.

The overall top third category was that of *personal secrets*, where teens described a need to keep aspects of their life private. Personal secrets include instances when a person would like to appear offline, a person’s personal information such as username and passwords, and instances of time spent with friends or family. A related category is that of *deviant behaviour* where mostly male participants talked about keeping activities that might be looked down as aberrant in society such as smoking hookahs, romantic relationships, and content of ‘saved’² posts private.

Teens were also somewhat concerned by app *data collection*, though most concerns were uninformed about how data is actually collected. Beyond the sentiments of “data usage by advertising companies” (session 1), and “wouldn’t like having his data sold to a third party company” (session 4), design artefacts spoke to pervasive myths or unproven statements about data collection techniques such as eavesdropping on offline conversations, and the ‘stealing’ of personal information by third-party entities from SNSs.

4.4.3 Task 2 - Persona image board. In task two, participants first constructed image boards that represented a persona’s social media account, and later labeled the board with reasons for why the personas might post what they would and what they might not post (see fig. 3). To construct their image boards most participants copied pictures from an image bank we provided and dragged them under the persona card. However, they were free to search for images outside of the bank if they felt the need to. The participants were then instructed to categorize the generated cards similar to how they had categorized them in activity 1 by placing similar ideas together.

The most popular type of reasoning when choosing a picture was that of *religion*. Religious posting included words of comfort and those of religious holiday celebrations such as Eid. A popular image

²Saving a picture is a feature on Instagram that collates pictures that users might want to bookmark for later



Figure 3: Teens in activity 2 labeled what a persona would or would not post. The figure shows a sampling from across sessions. Source: Top-left from session 3, top-right from session 3, bottom-left from session 4, and bottom-right from session 2.

posted in every session after the first (after we included the image) was one that read “*Sabr* (patience), your time will come”. Religion was also used to understand what being conservative or liberal meant. Khadija, our persona with her parents and older brother on her social media account was perceived to make religious posts and was seen as engaging in significant self-censoring. In contrast, Nauman and Sara, described as popular teens with public accounts who expressed themselves relatively freely and had both male and female friends, were perceived to be less religious. In either case (Khadija or Nauman and Sara) their personas made no reference to religion. This freedom or lack thereof for self-expression corroborates our findings where conservative users of social media were seen to be more likely to limit their expression. This also supports our insights from our interviews of the deep impact religious beliefs have on participant posting and privacy behaviours. These limitations to self-expression may be explained by our findings from our interviews in section 4.2.2, where we discuss how young people in Pakistan face active religion based moral policing online.

The second and third most significant types of posting was content that was specifically catered to meet the expectations of family and friends, respectively. Khadija’s persona revealed attitudes towards a family orientation which were associated with self-censor and consisted of notions of ‘respect’ towards elders. Nauman at the other end was seen as someone that would tailoring his content towards for friends by posting pictures of his hangouts with them. Posting pictures of friends may be a strategy to reaffirm relationships by validating them online [60] and as our participants explained to gain social capital or in their words to ‘look cool’ (session 1).

Of note in our findings from task 2 is how they corroborate and explain our findings about familial and societal pressures from our interviews. Participants identified the top three regulating forces on social media as informed by expectations from religion, family, and friends. Another factor affecting posting behaviours was personality. Farhan and Khadija, our less popular young people personas, would not post as much because they were seen as ‘reserved’ or

'hardworking'. Young people were also aware of self-presentation performances online, particularly some of the girls were suspicious of Nauman's public facing persona (see top-left image in fig 3). He was seen as being facetious when posting about feminism, only doing it *to get popular*. Interestingly, this was backed by how boys did not see Nauman posting feminist content, one participant explained this in terms of Nauman's limited exposure to women as friends. If Sara was to post the same content however, she was seen as a proponent of gender equality.

Other content that our personas posted was *funny content* and content related to their hobbies. No card was labeled with data collection concerns.

5 DISCUSSION

Our findings show that privacy experiences of young participants in Pakistan are severely affected by contextual factors. We revealed that our participants navigate multiple conflicting pressures, expectations and control from different stakeholders including parents, peers, religious beliefs and gendered expectations (Figure. 4 in Appendix). These demands influence how participants use privacy-preserving strategies including but not limited to private accounts, using real-world physical networks to 'reputation-check' individuals, limited lists, asking male friends to not tag them in pictures and using different applications and multiple accounts targeted to different audiences. Some of these practices are ubiquitous amongst young people and have been reported in earlier studies in WEIRD countries [40, 41]. However, the hyper-awareness of potential privacy violations, privacy risks, and the forms that privacy harms take, particularly amongst our female participants is unique to the context of teens in Pakistan. Additionally, the significant impact religious beliefs and values have, and the expectations of being seen to uphold these beliefs visibly in online spaces add complexity and nuance to understanding privacy design. In contrast to prior work suggesting risk taking practices among teens in the U.S. [26], we find teens in our sample to be very risk-aware and risk-averse, setting up protective practices *in anticipation* of a risk or expected harm. Unlike prior work exploring privacy practices amongst women in the Global South, young people in our sample are tech savvy, literate, more aware of the potential harms in online spaces and actively working to set up protective measures to navigate these harms. This contrasts starkly with the strategies of avoidance reported in earlier work focusing on women in Bangladesh, India, Pakistan and the Arab Gulf [2, 51, 57], where much of the emphasis is on privacy-literacy or when exploring religious intersections focuses specifically on religious scholars and teachings. In contrast our findings highlight the ways in which teens who are influenced by multiple factors (Figure.4 in Appendix) enact privacy through a religious lens. To make these findings more accessible to privacy designers and other researchers, we developed four personas that reflect the spectrum of preferences and behavior we found in the interview data.

5.1 Non-normative Privacy

While we focus on the norms that determine information flow and privacy behaviours [48] we find that focusing on the norms alone ignores the power dynamics embedded in *who* sets the norms,

and *who* is then upholding the norms. This finding from our semi-structured interviews is also supported by the subsequently conducted focus groups, where specific scenarios were considered.

As highlighted by Marwick et al. fundamentally privacy is a social norm [9], and consequently given the significant difference in the social context and values of Pakistan compared to say the USA [41] or the EU [46], the ways in which privacy is enacted and how the harms manifest and for whom also differs. So we find young gender plays a significant role in determining experienced harms and the offline impact of online harms.

In our case the norms are determined by parents, the dominant religion and culture, which are then being upheld by adolescents who have little control or choice in determining the norms but are forced to carry the burden of behaving in specific ways to uphold them. Additionally, the dominant norms do not impact both genders equally. So, norms around family honour, modesty, piety, and reputation dictate whether particular behaviours are considered violations and disproportionately impact female teenagers.

Gender. The vulnerabilities of non-dominant groups are often invisible and the normative design of applications and technologies means young people in our context are unable to break away from these pre-determined 'appropriate' ways of being and doing. One strategy employed by both male and female participants to carve out non-normative, freer, safe spaces with additional privacy and a lack of surveillance from family members is creating or joining restricted online spaces. This however means exclusion and marginalization from the broader digital space.

This interaction of norms and power structures is particularly salient for gendered norms around adolescent girls role, the various religious and social sentiments attached to their existence, and the resulting surveillance it causes in their lives. This surveillance is sometimes passive, enabled by platform features that let other users know who has interacted with what on social feeds, or active because SNSs catalog user activity for others to observe for later (e.g. your history of likes on Twitter is available for anyone that is following you).

We find young female users negotiate online spaces from a place of fear; afraid of revealing information or images that might bring shame on the family, afraid of being tagged in pictures with boys which might then get back to their parents, afraid to open their DM's for fear of unsolicited messages from older men. In contrast, prior work reveals college women in the U.S. disclose personal information on Facebook at a greater level than do men across different categories, like the "About Me" section, photo albums and images of the self in a central photograph [32]. Similar to our sample population several studies in the Global North also highlight women perceive more risk online and report more privacy concerns than men [18, 25].

Similarly, our male participants enact complex privacy strategies to hide relationships and interactions with the opposite gender from parents and also carry the weight of bringing shame on the family. This fear stems from an overwhelming focus on societal '*norms*' of piety, purdah and family honor which while disproportionately borne by female participants also impact young men and are determined by parents, religious beliefs and deep rooted patriarchal structures.

Religion. Islamic beliefs are the central value system used to define privacy boundaries and behaviours. In particular, gender norms rooted in the Islamic belief in Purdah and modesty play a strong role in determining what is and is not considered a privacy breach. DM's from strange men as a transgression for young girls (but not young men) is rooted in the Islamic belief of 'Mahram'; a segregation of the opposite gender based on familial relationships or gender. A Mahram is a member of the family with whom marriage would be considered illegal under Islamic law and from whom purdah, is not obligatory. Purdah is also not mandatory with people of the same gender. And so for our female participants other women are Mahram, but only a subset of male relatives are. For our male participants only a subset of their female relatives are considered Mahram. Our participants enact gender segregated spaces, using either private groups or limited lists, restricting access to their profile pictures, as a way to enact digital purdah by limiting audiences based on these Islamic principles. We can imagine then that for a male adolescent it is perhaps important to present a pious, digital identity embedded in his family's Islamic beliefs, but also important as a young person to be able to explore his own identity in surveillance-free spaces and without the expectation to uphold his family's religious values. We find that given the secular framework in which privacy has been conceived and enacted our participants face a great deal of friction in enacting boundaries based on their Islamic faith.

In contrast, studies exploring young people privacy concerns and the norms that determine those concerns in the U.S users' information privacy behaviors are affected users' perceived importance of information privacy, information privacy self-efficacy and parental influence instead of religious values [11, 71]. Similar studies exploring older teens attitudes towards online privacy and safety in the U.S. reveal teens are less concerned about their physical safety, tending to feel safe online but do however, feel concerned about their privacy are are careful about what to share publicly vs within a group [4]. Factors contributing to teens privacy practices in the U.S. are friends' privacy settings, type of contacts, specific privacy concerns, past experiences and the presence of parental restrictions or surveillance [39–41, 62, 73, 74], in contrast to what we find where in addition to friends religion and religious values along with gender and patriarchal norms play a significant role in determining privacy behaviours or concerns.

5.2 Directions for Future Research and Design

In this section, we discuss potential ways forward towards re-imagining a privacy design that can help moderate privacy in the given cultural context and beyond. The following recommendations are based on 1. designing for an evolving independent identity (outside of cultural or parental influence), 2. designing to allow young people more control over the boundaries and beliefs they choose to enact online and 3. ensuring young people feel *safe* online. The presented personas reflect the spectrum of privacy preferences and reflects the needs and values of our interview participants. Our data suggests that cultural-specific measures, such as *digital Purdah* to allow people to enact boundaries based on the Purdah and the concept of *Mahram* in digital spaces is importance to consider. As

such, norms that are present in the offline world could be transferred to online spaces. While such an approach can help replicate cultural and religious norms in the online world, it also restricts online interactions in a certain way. We argue that such approaches should be explored in future work to understand if the benefits outweigh the limitations of such an approach.

Besides measures that are determined by the cultural context, our work elicits user needs that are also present in other cultural contexts. Our work however goes beyond replicating these implications for future research and design, as our data highlights the severity of offline real-world consequences of privacy problems in restrictive and patriarchal countries such as Pakistan for vulnerable populations like teenagers who are minors and have little agency and decision-making control. Our work thus strengthens a long-existing call for improving privacy mediation in digital spaces.

In particular, our data suggests that platforms should better inform users about who is using or misusing their data and restrict functions such as making screenshots and screen recording. This feature is informed by our participants who pointed to Snapchat's notification feature that lets them know if their pictures meant for private consumption have had a screenshot taken 4.2.4.

Our findings further support the suggestion of contextualized prompts from Masaki et al. [42] highlighting that adolescents might benefit from nudges at various points of their experience to make informed decisions especially in reference to potential offline consequences of said decisions.

Many participants feared harms associated with unsolicited direct messages, which is a problem that is also transferable to other cultural contexts and age groups, especially for minors. Filtering potentially traumatic content (contextualized) would ensure young people have an additional layer of safety online. In particular, a oft repeated concern by our participants was the absence of any boundary that prevents older men messaging minors - this is particularly problematic given the nature of these messages, as presented in Section 4.1.1.

6 CONCLUSION

Our work highlights the importance of gendered and religious values in driving privacy expectations amongst young people and their subsequent online behaviours suggesting the importance of understanding localized, contextual belief systems which have a significant impact on online experiences of safety and privacy. Furthermore, we contribute personas to make privacy behavior and preferences of Pakistani teenagers more accessible to designers, who want to consider this particularly vulnerable group of users. Design decisions that are made accordingly will also be beneficial for other users in different cultural contexts.

Our qualitative findings, along with the developed personas and design recommendations can thus help designers to better understand the design space and to validate use cases and scenarios in which privacy controls are particularly needed by vulnerable adolescents who are not aware of the implications of their behavior.

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7 APPENDIX

7.1 A. Interview Protocol

Interviewer instructions

Work on building a strong rapport, start with ice breaker questions.

Let participants know they are free to skip any question that they are not comfortable answering.

Approach intimate topics like online-bullying or privacy breaches with care. If the participant is uncomfortable, leave the topic.

Ensure you have consent before starting. Also ensure you let the participants know how their data will be protected. Ask for permission before recording.

Interview Questions

- Do you consent to this information being used for our study?
- Are you comfortable with Urdu or English?
- Please feel free to skip any question that you're not comfortable answering
- (Ice breaker question) What's the kind of music you listen to? What's your favourite song?

Demographics (Pre-survey)

- What is your age? (to confirm for paper data)
- Could you tell us what gender identity you identify as?
- Where are you from? City or town, both acceptable.
- What grade are you studying in?
- How many devices do you use to access the internet? What are these devices?
- Do you share any one of those devices?
- How many social media accounts do you have? Which ones?
- Who set them up? When did you set up your first account

Persona information (direct)

- what is your family like? Joint family?
- Are they conservative? Do you go on holidays?
- What does your mother do? Are family events mixed?
- What do you like to do? Do you have a special talent? What do you like to do with your friends?
- Do you get together with friends after school?
- If yes, can you describe a recent hangout?
- Do you have supervision when you go out? What is this supervision like?
- If not, why do you think that is? (Need to read the room for this question)
- What other activities are you not allowed to do or during which you are chaperoned?

Digital Literacy

- Have you attended sessions on privacy/internet/social media use? How many sessions?

- How'd you use what you learned, if at all?
- How have you been taught about privacy in school?

Mental Health

- What is the stuff that stresses you out?
- How would you describe your life right now?
- What do you do about it?
- Do you reach out to a support system? Is this support system online or offline?

General Privacy concerns, interpersonal harms and disclosure practices

- Have you ever been bullied?
- Would you like to talk about it?
- Can you think of some activities that teens might do on social media that they don't want their parents or other people to find out about?
- What do you think that boys do or girls do that they might want to stay private?
- Can you explain what you think privacy means?
- Do you think about privacy when you're using social media?
- Please describe any concerns you have about privacy on [app], and briefly explain why you're concerned about those things.
- Do you believe anyone will leak things you've shared on [app] to other people?
- How bad would that be?
- Can you think of an example of this happening to you or anyone you know? Do you think it'll happen in the future?
- Do you believe anyone will see things you've shared on [app] that you don't want them to see?
- How bad would that be?
- Can you think of an example of this happening to you or anyone you know? Do you think it'll happen in the future?
- Do you believe anyone will use information you've shared on [app] to harm you? How bad would that be?
- Can you think of an example of this happening to you or anyone you know? Do you think it'll happen in the future?
- Do you believe anyone you aren't connected to on [app] will send you unwanted messages on [app]? How bad would that be? Can you think of an example of this happening to you or anyone you know? Do you think it'll happen in the future?
- Do you believe anyone will tag your [app] account with anything you don't want to be tagged in? How bad would that be? Can you think of an example of this happening to you or anyone you know? Do you think it'll happen in the future?
- Do you believe anyone will add you to a group on [app] that you don't want to be added to? How bad would that be? Can you think of an example of this happening to you or anyone you know? Do you think it'll happen in the future?
- Can you give an example of things you think are completely private (for you only), those for your friends? and those for family? Are there specific things only for your female/male friends (depending on gender of participant)?
- Do you have tiered friends' privacy, i.e. an inner circle and an outer circle? Who has access to the inner circle?

- What do you share with them? How is the separation between maintained?
- Do you access groups/digital spaces with only women/men? (ask depending on gender of participant).
- Do you have extended family on social media? How do you prevent extended family from seeing specific things? What are these things?
- If you have parents on your social media accounts how are you navigating privacy between what you're comfortable sharing with them and what you are not?
- Are you more comfortable with one parent seeing your digital identity as opposed to another? (perhaps mom?)
- How often do you change your privacy settings? Which settings are the default for you in [app]?
- What is the strictest privacy setting you use? why? for what?
- What is the worst invasion of your privacy?
- What is your greatest fear with social media usage?
- What would you do if any of the above things would happen to you?
- Do you know the procedure to perhaps report something on social media, or other avenues for redress?
- What is something that would make you feel safe online? (Social media companies responses, state responses, app features, better privacy policies etc)
- Privacy concerns wrt data collection and access
- Please describe any concerns you have about the way [app] uses the data it collects, and briefly explain why you're concerned about those things.
- Do you believe [app] monitors your location by using your phone's location services? If so, would it be good or bad?
- Do you believe [app] collects information about what you purchase offline (in physical stores)? If so, would that be good or bad?
- Do you believe [app] records your offline conversations by using your phone's microphone? If so, would it be good or bad? If bad, how bad?
- Do you believe [app] collects information about what you do on sites and apps other than [app]? If so, would it be good or bad?
- Do you believe [app] uses information about you to determine what to show you [app]? E.g. friend and group suggestions. If so, would it be good or bad?
- Do you believe [app] uses information about you to determine what ads to show you on [app]? If so, would it be good or bad?
- Do you believe [app] shares information about you to advertisers? If so, would it be good or bad?
- Do you believe [app] shows other people information about what you do on [app]? If so, would it be good or bad?
- What would you change about online spaces to make them better for yourself?
- Is there anything else you'd like to share about your experiences or opinions regarding privacy on social media?

7.2 B. Focus Group Activity Protocol

7.2.1 *Activity 0.* : Introduction and tutorial to the day of activities [10 minutes] **Icebreaking** - do any of the following:

- (1) 2 Minute portrait - We divide the participants in pairs using breakout rooms. Each person in a pair draws the other person in 2 minutes. After time is over we have to guess who is who.
- (2) Participants draw their favorite animals. The first takes 1 minute, then 30 s for the next and 15 s for the last
- (3) Post one lie and one truth and others have to judge which is which

7.2.2 Activity 1: Reasons to use social media and privacy concerns. The group brainstorms ideas about the reasons to use social media and privacy concerns for themselves. They do this by posting posts on the jamboard. Once they are done, we organize them together and think about if we missed anything.

- Rate their most pressing concerns by stamping on the posts (everyone gets 1 stars/anything emoji thing they want for a category)

– **Lunch Break for 20 minutes** –

7.2.3 Activity 2: Constructing an instagram profile . Group activity - Post what is 'acceptable' together by 'posting pictures' for personas made prior to the workshop. Participants divide into groups of 2 or 3 and start working on 'posting' for each persona from a database of prior pictures. Participants should post 4-5 pictures. Important note: participants should only post 1 picture of 1 idea (e.g. if you think the person will post memes, only post 1 meme). In the end we will have a session discussion the personas together as a group and will add to each persona as a focus group. On the posted pictures participants should label:

- Why did the personas post these images?
- What couldn't the persona post? Why?

7.2.4 Activity 2.1: Categorize the reasons to post and reasons to not post. Participants categorize the reasons to post and reasons not to post as groups. Probe each personas motivations of posting what they post to understand disclosure practices.

7.3 C. Codebook

High Level Code/Theme	Explanation	Codes
Privacy Importance	Instances of participants describing the importance of privacy in their life	control,control over being watched, gossip, screenshot, mental health,safe space, no-judgment, from parents,safety
Social media usage	The social networking sites participants use and the purpose for which a specific SNS is used.	facebook for school societies,snapchat most used,lurk on instagram, facebook for family,snapchat more personal,everyone is on instagram, playstation account,tiktok
Online Harassment	Describes the instances of harassment of children	men responsible,DMs,harsh comments, threats crossing professional boundaries, trolling, Harassment in DMs.
Technology Access	The age that participants had access to tech and number of years of usage.	early introduction,Shared access to TV,personal phone, Laptop for school, ipad, shared ipad,desktop shared
Privacy violations	Experienced Privacy violations that participants can recall in reference to their own experience or of their friends/cousins/siblings/parents/.	gossiping, repeated messaging,screenshots, leaked chat private information made public,Unwanted messages through hacked Whatsapp, leaked picture,Bullying, Catfish,Fake Profiles, pop ups,inappropriate ads,
Inappropriate Social Media Usage	What are the ways in which teenagers use social media inappropriately i.e. what their parents would not let them do at their age.	Sharing adult memes, watching adult web series,sharing content with abusive language
Privacy Definition	How participants describe or understand privacy	inner circle,freedom from intrusion, no questioning online use, no unconsented access to content
Privacy concerns	What are the most pressing privacy concerns and what makes them feel unsafe.	Hacked accounts, Leaked personal chats, Unwanted messages in DMs, Hacking of accounts through unknown links, Mental Health triggering messages in DM, Random Tags on Inappropriate content, Non consensual addition to groups, Data shared publicly without consent,Privacy invasion through phone's microphone/ Offline chats getting recorded without consent,search history, Facebook and Instagram connected, location tracking
Privacy Behaviours	Mechanisms participants employed to ensure privacy online and to protect themselves	Content sharing with selective people, Connecting to selective people, private profile, Facebook asks before tagging, add friends only, add mutual friends, hide story,app lock,location services disabled,gendered groups, close friends lists, private account, filtering,hiding stories,filtering on snapchat,multiple accounts on Facebook and instagram,
Privacy knowledge	What kind of privacy knowledge do participants have and where have they learnt it from.	google privacy survey,older siblings,school notice board,trial-error,school workshop
Response to Privacy Violations	The kind of actions participants took once their privacy was violated	alert friends, do not share with family, share with family,block, change password,delete DM requests,delete all data posted online,delete inappropriate DMs,exit groups, involve school,report on platform,delete post, remove unknown people from connections
Parental Restrictions	Online behaviours, content, pages and applications that are restricted and monitored by participant parents	Adult meme,content with abusive language, drugs-related,embarassing content (meaning sexual in nature),DMs,online relationships,overage activities, public content, public accounts,porn,spam pages,stranger connections,vaping, watching adult web series,sexting.
How to make social media safe?	What are the design decisions that social media platforms must take to make the social spaces safe	No DMs/ message requests, No redirects to unwanted websites,Notify upon screenshots taken by someone(eg. Snapchat), consent before collecting data, context-aware community guidelines, disappearing chat, active platform moderators/monitors.

7.4 D. Stakeholders in an Adoslescents Life

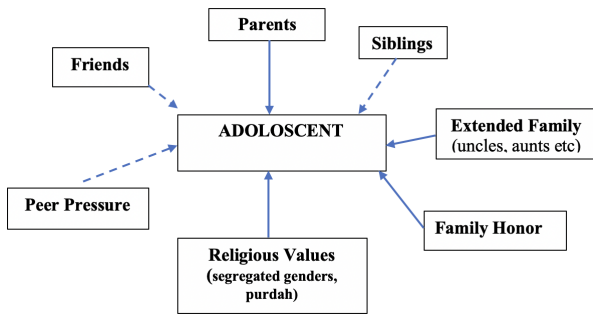


Figure 4: Stakeholders in a Pakistani adolescent’s life that set norms that must be upheld. The most significant relationships are indicated with complete arrows while relationships that exert less influence on online behaviours are indicated with dashed arrows.

7.5 E. Persona Image Board Labels

Table 5: Overall persona image board labels by number of cards in category (Total 61 notes categorized) ³

Overall	Female	Male
Religion (25%)	Personality-based posting (20%)	Religion (42%)
Family orientation (13%)	(to get) popular (14%)	Friends orientation (19%)
Friends orientation (11%)	Religion (11%)	Family orientation (15%)
Personality-based posting (11%)	Family orientation (11%)	Funny content (%8)
Funny content (8%)	Gender equality or activist (5%)	Education (5%)