

Teens as Co-Researchers: Advocating for Disruptive Change to Engage Youth Meaningfully in Online Safety Research and the Design of Social Media

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Academic research is largely an adult endeavor that creates systemic power imbalances when studying teen-centered topics, such as adolescent online safety. To rectify this problem, we engaged seven teens as co-researchers through a year-and-a-half-long Youth Advisory Board (YAB) program to critically assess our research processes, lead online safety solutions, and to reflect on their experiences participating in a YAB. Teens pushed back on standard research practices such as parental consent, sought decision-making power in study documentation, design, and execution, and gave more meaningful feedback on research protocols when more deeply involved in the research. For safety interventions, teens proposed both incremental changes for social media platforms (e.g., advanced privacy settings) and more disruptive changes (e.g., decentralized social media platforms) that enhance individual control, digital resilience, and equity. For the YAB, teens highlighted challenges, such as losing momentum over time, lack of collaborative opportunities, and competing interests, fueling frustrations and rifts in engagement. Our research underscores the value of involving teens as co-partners in shaping online safety research. Finally, we provide design implications for social media safety interventions that strengthen teens' agency and actionable guidelines for developing future long-term programs to ensure meaningful contributions to online safety research.

CCS Concepts: • **Human-centered computing** → **Empirical studies in HCI**.

Additional Key Words and Phrases: Online Safety, Asynchronous Research Community, Privacy, Adolescents, Teens, Social Media

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1 Introduction

Traditional adolescent online safety solutions to address risks, such as unwanted cyberbullying to privacy breaches [11, 55, 83, 94], tend to focus on restrictive approaches like parental control and oversight [7, 31, 82, 87], leading to the creation of global policies for teens' online safety without their input [74]. This introduces systemic injustices that [13, 22] marginalize teens by deprioritizing

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their needs and voices in online safety solutions [7, 89]. To address such injustices, prior HCI and CSCW researchers have made devoted efforts by co-designing with teens to innovate and redesign online safety solutions (e.g., [3, 14, 22]). However, power imbalances between teens and adult researchers often emerge in this participatory practice due to the knowledge gaps [65] and authority dynamics [27], making teens feel undervalued in research collaborations. Especially, the current adolescent online safety research often operates within adult-driven institutional systems like universities, institutional review boards (IRBs), and funding bodies, reinforcing the systemic injustices and eventually limiting teens' agency and online safety.

Addressing these injustices requires a *design justice* approach, which emphasizes centering marginalized communities by valuing their lived experiences and expertise in shaping equitable solutions [24, 25]. Design justice challenges traditional designer-centered models by prioritizing meaningful community participation in design processes [24, 42]. Indeed, recent HCI and CSCW researchers [11, 14, 21] have sought to empower teens by involving them in refining either online safety solutions or research practices. For example, Agha et al. [3] addressed equity gaps with teens' design skills by educating them with UX design skills to lead their own online safety designs to address risks like information breaches and stranger danger. Concurrently, researchers have engaged teens through meta-level research for their online safety [14, 86]. Meta-level research refers to evaluating and improving research practices, including methods, reporting, and ethical considerations [41], to make them more just and equitable by addressing bias and centering vulnerable communities [22]. For instance, HCI and CSCW researchers have involved teens in refining research methodologies and found that teens wanted co-design research to be mutually beneficial in terms of ensuring their voices were heard and providing tangible benefits to their broad adolescence communities [15, 18, 22].

Still, further evidence is needed into how teens can contribute holistically as co-researchers throughout the process of online safety research, encompassing both the refinement of research practices and the leadership of their own online safety design projects. To pursue this goal, we engaged teens as research partners (i.e., co-researchers) through a Youth Advisory Board (YAB) program, empowering them to address issues affecting their well-being by centering their voices in research practices and fostering long-term partnerships for continued development of ideas [15, 18, 22, 59]. As such, our YAB followed design justice principles, emphasizing meaningful teen participation and redistributing power [24, 25] to confront systemic injustices in teens' online safety design and research. Thus, we ask these research questions:

- **RQ1:** *What important considerations do teens suggest as co-researchers for designing more just and equitable research studies for adolescent online safety?*
- **RQ2:** *How do teens as co-researchers lead their own online safety projects to innovate design solutions that address their diverse needs and promote digital equity?*
- **RQ3:** *What reflective feedback do teens give about their participation in the YAB program?*

We engaged seven teens (aged 15-17) for a year and a half in a Youth Advisory Board (YAB) program based in the US. As part of the program, we taught them basic UX design skills (e.g. storyboarding) and industry-standard tools (i.e., Figma), which they utilized to create their own online safety UX projects (RQ2). We also elicited written feedback on lab research protocols and allowed teens to participate in research studies to help improve their design (RQ1). Finally, we held individual feedback sessions to gather their insights on the YAB program (RQ3).

Overall, we found that teens pushed back on standard research practices such as asking for parental consent, claiming it threatened their autonomy and agency for participating in the research (RQ1). Moreover, they wanted research to be more flexible and open-ended instead of bounded by strict guidelines, with increased collaboration, inclusivity, and responsiveness to their needs. We

also observed that teens' feedback was most effective when they engaged with more hashed-out study designs while also actively participating in them. Teens designed various solutions that promoted digital resilience and equity, including incremental changes, such as advanced features like safety nudges embedded within social media platforms. Additionally, teens advocated for more disruptive changes, envisioning new digital spaces free from profit-driven tactics that exploit user engagement (e.g., decentralized social media platforms) (RQ2). The teens' feedback on the YAB program highlighted their need for varying support based on motivations and interests, along with more opportunities for peer-to-peer collaboration (RQ3).

Our paper bridges meta-research on teens' participation as co-researchers in online safety research (RQ1 & RQ3) with a design-oriented analysis of how their engagement shapes safety solutions (RQ2), presenting twofold contributions. First, we empower teens as co-researchers in providing direct feedback on online safety research practices (e.g., ethics review and study designs) to help address the injustices in the institutional systems that marginalize their voices. Our work challenges the existing online safety research landscape by advocating for increased teen agency and offering evidence-based guidance on when and how to engage teens to ensure meaningful contributions. Second, we equipped teens with necessary skills to lead their own design projects, further pressing the need for enhancing research methods for meaningful teen engagement. We provide design implications that disrupt the status quo, empowering teens to regain control over their online safety. Finally, our work advances the CSCW and HCI community by providing actionable guidelines for designing long-term research programs with teens, facilitating enhanced engagement, and maximizing their contributions.

2 Background

This section reviews how prior work understands and addresses systemic injustices in teens' online safety solutions and research. It further reviews Youth Advisory Boards (YABs), which can serve as a viable way of empowering teens to refine both research practices and online safety solutions.

2.1 Systemic Injustices in Teens' Online Safety

Traditional adolescent online safety solutions have often marginalized teens by ignoring their voices and needs. For example, early solutions predominantly focused on restrictive mediation, like parental control apps that enforce media consumption rules, such as screen time and message controls [45, 48]. Such approaches perpetuate a system where teens' agency and perspectives are overlooked by parents [90], safety solution designers, developers and policymakers [19, 30]. These collectively exemplify *systemic injustices*, the deep-rooted structures and practices that marginalize teens by excluding their voices from critical decisions impacting their online safety and autonomy [13, 22].

To address these injustices, HCI and CSCW researchers have indeed started to evaluate and redesign safety solutions, such as assessing parental control apps [7, 87] and social media content moderation [72, 91], and further promoting online safety education [37, 57]. While these efforts are a promising beginning, they are often adult-driven, leaving a limited understanding of how systemic injustices arise, specifically within research practices on teens' online safety. For instance, insights from other fields like health and social sciences, suggest that Institutional Review Boards (IRBs) may inadvertently marginalize youth by overly restricting their participation, driven by assumptions about youths' vulnerability [35]. Such overprotection can silence youth voices by overestimating their need for protection and underestimating their capacity for agency [53, 78, 84], which can disproportionately impact youth—minorities, immigrants, and those with disabilities—who already face additional challenges to research participation. Our study thus aims to contribute towards addressing these systemic injustices by empowering teens as co-researchers to refine both online

safety solutions and research practices, ensuring their agency and voices are central in bridging the gap between them.

2.2 Applying Design Justice Approach for Teen's Online Safety

Prior research has informed that *design justice* is a key approach to rectifying systemic injustices [25, 36]. Design justice, as articulated by Costanza-Chock [24], examines how design practices challenge the “matrix of domination,” including white supremacy, heteropatriarchy, and capitalism, to center people who are normally marginalized by design and uses collaborative practices to address these challenges. On the one hand, this design approach emphasizes the importance of valuing community contributions [25, 42], and prioritizing the inclusion of historically underserved individuals [36, 68, 76]. Thus, design justice aims to create equitable and diverse design outcomes [75, 85]. On the other hand, this approach aligns with the broader goals of participatory design research, which seeks to foster deep and meaningful participation for promoting participant voices in research [29, 36, 38, 77, 88].

More researchers have involved teens in co-design activities to create just-orientated safety solutions (e.g., [11, 12, 92]). However, such initiatives also face challenges, including power imbalances arising from differences in expertise and authority between teens and adult researchers [64, 65]. This imbalance can lead teens to focus on finding “the right answers” rather than engaging creatively [47]. Also, teens may feel they lack the skills and expertise to act as equal partners [28]. Recent co-design work thus [3, 14] urges equipping teens with the necessary knowledge and power to take an equal role in the design process [40].

Concurrently, HCI and CSCW researchers have begun advocating for meta-level research to address injustices embedded in research practices (e.g., [4, 14, 22, 66, 86]). Meta-level research focuses on evaluating and improving research practices, including methods, reporting, and ethical considerations [41]. Teens have expressed a desire for online safety studies that are engaging, personalized, transparent about data sharing, and offer accessible information about those studies [14]. Also, involving teens in discussions and study design can help address ethical issues related to online data collection on teens effectively [26, 39]. Despite these justice-oriented efforts for teens, more is needed to refine both research practices and online safety solutions, as recent research calls for long-term participation of teens [15, 18, 22]. Therefore, our study applies the design justice approach by establishing long-term Youth Advisory Boards (YABs), empowering teens as co-researchers in online safety research and safety solution (re)design. Next section reflects on the YAB's role in fostering youth engagement and centering teens' voices in research and design.

2.3 Youth Advisory Board for Teens' Online Safety

Youth Advisory Boards (YABs) have been valuable for directly involving teens in long-term research, fostering equitable skill-building and knowledge exchange [69]. YABs give teens an active role in addressing issues impacting their health and well-being, especially within systems that influence their development [59]. For example, in digital health interventions, a YAB of low-income, minority youth aged 13–24 contributed to the design of a health app by providing feedback on food, exercise, and socializing trackers, ensuring the app was engaging and useful for teens [46]. In another case, YAB input was central to developing a gamified smartphone app that educated African American teens on sexual health; the advisory board's recommendations led to an interactive, realistic dating simulation game that resonated with users' experiences [62]. These boards have also been employed across various fields, ranging from civic policy [23] to adolescent health research [58].

While YABs have shown effectiveness in these areas, their application for teens' online safety is still emerging. As adolescents face increasing exposure to online risks, such as cyberbullying, inappropriate content, and sexual exploitation [7, 8, 60], HCI and CSCW researchers have initiated

co-design efforts that involve teens as co-designers in creating online safety solutions [3, 10, 14]. However, such efforts tend to focus on co-designing specific solutions rather than fully involving teens in shaping the holistic research process. Our YAB approach addresses this gap by engaging teens as co-designers and researchers in both online safety research and solutions.

3 Methods

In this section, we summarize the details of our YAB program, participants' recruitment, and demographics, along with describing our qualitative data analysis approach.

3.1 YAB Program Overview

Based on the design justice approach, our YAB involved teens for a year and a half as co-researchers in various stages of teens' online safety research to help shape adolescents' online safety research and co-design safety interventions. We conducted 18 sessions via Zoom with seven teens from the United States from May 2022 to August 2023 (see fig 1). After the orientation meeting, we held monthly study review sessions to get feedback on research protocols and allow them to participate in research studies. To center teens' agency and voices in design process, we held bi-monthly workshops where we taught UX design concepts, empowering them to lead their own online safety projects. For team coordination and research-oriented discussions outside of the regular meetings, YAB members were also involved in the asynchronous research community (ARC) [17] using Discord¹ to reflect their community experience [44, 61]. We conducted exit interviews with YAB members for their insights on various activities of YAB.

3.1.1 Recruitment and Demographics. We recruited teens through an outreach campaign targeted toward youth-serving organizations and high schools. Potential members completed a pre-screening survey via Qualtrics to confirm they were 15-17 years old, from the U.S., had internet and computer/smartphone access, and could commit enough time to YAB. After meeting the eligibility requirements, we acquired parental consent and teen assent. To gather in-depth perspectives, we employed a purposeful sampling approach to select teens interested in actively contributing to online safety. To achieve this, eligible teens were invited to apply by submitting an application with open-ended essays on their social media use, vision of online safety, and motivation for joining YAB. After thoroughly analyzing their responses, researchers selected finalists for a 10-15 final interview, where they further gained insights on the teens' motivation for applying, creativity in problem-solving, and awareness of current online safety needs and trends. Subsequently, researchers did a final review to select the final YAB members. All the YAB members were from the United States, between the ages of 15-17, and enrolled in high school when they signed up. Our diverse group included members who identified themselves as White/Caucasian ($n = 3$), Asian ($n = 3$), and Black-African American ($n = 1$). We had a balanced gender representation with 4 male and 3 female members (see table 1). Teens were given certificates of participation and gift cards of up to \$450 for compensation. A total of three researchers helped run the YAB program, maintaining a 2:1 ratio of teens to researchers to ensure each teen received ample support for the successful completion of the program.

3.1.2 Ethical Considerations. To ensure ethical standards, we obtained Institutional Review Board (IRB) approval from the last author's institution before beginning the recruitment process. All the researchers completed IRB CITI training and Protection of Minors (POM) training. For data privacy and confidentiality, we removed all personally identifiable information from the data and paraphrased the quotations as an extra precaution to safeguard participants' anonymity. Further,

¹<https://discord.com/>

Table 1. Participants’ Demographic Information

ID	Age	Sex	Ethnicity	Social Media Usage
P1	16	M	East Asian	YouTube, Instagram, Reddit
P2	16	M	White/Caucasian, Latino/Hispanic	YouTube, Instagram, Reddit
P3	15	M	White/Caucasian	Snapchat, YouTube, Instagram
P4	17	M	White/Caucasian	YouTube, Instagram, Twitter, Reddit, Other
P5	17	F	South Asian	YouTube, Instagram
P6	15	F	South Asian	Snapchat, YouTube, Instagram, Facebook, Reddit, Other
P7	16	F	Black/African-American	YouTube, Instagram, Twitter, Other

we conducted qualitative analyses using university-approved, secure shared storage, ensuring that no team members uploaded data to the cloud or their personal devices.

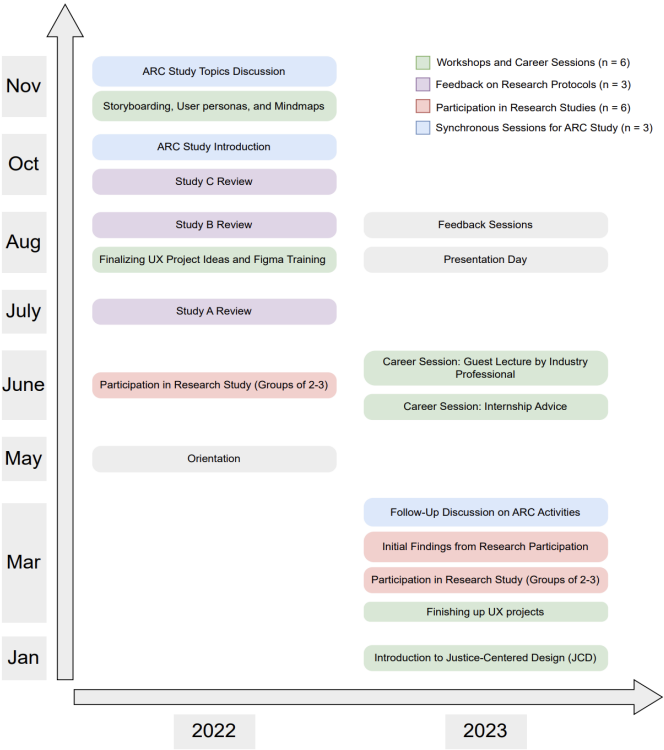


Fig. 1. YAB Synchronous Meetings Summary

3.2 Study Procedures

In this paper, we focused on the UX design workshops, study reviews, and reflective feedback sessions on YAB. Throughout YAB, we conducted six design workshops to 1) teach various UX design concepts such as storyboarding, user personas, mind mapping, and prototyping techniques, 2) present innovative methodologies (e.g., JCD), and 3) introduce UX as a potential career path.

Building on the skills gained from the workshops, teens led their own online safety UX projects. As one of the main goals of YAB, we also carried out three research study reviews with teens as co-researchers to elicit feedback on our research protocols. Each meeting was 2-3 hours long with a combination of hands-on design activities and take-home assignments. After the completion of YAB, we held individual, hour-long interviews with all the YAB members to get more detailed and open feedback on the entire program. Below, we outline the various activities of these sessions.

3.3 User Experience (UX) Skill Building and Career Development

To enhance teens' skills for research activities [3] and future career prospects, we conducted 6 workshops to teach teens key UX concepts and methodologies. First, we introduced teens to storyboarding, user persona, and mind mapping (see Fig. 2) aided with examples. Additionally, to help teens create interactive prototypes for their design ideas, we conducted a workshop on Figma [33], covering its basic tools and features, followed by a quick app design exercise (see Fig. 2). To situate our discussions within the justice-centered design (JCD) approach, we introduced teens to the principles of JCD that focus on prioritizing teens' autonomy in online safety. To highlight the significance of their work, we also held two sessions providing insights into real-world applications of UX concepts and career guidance.

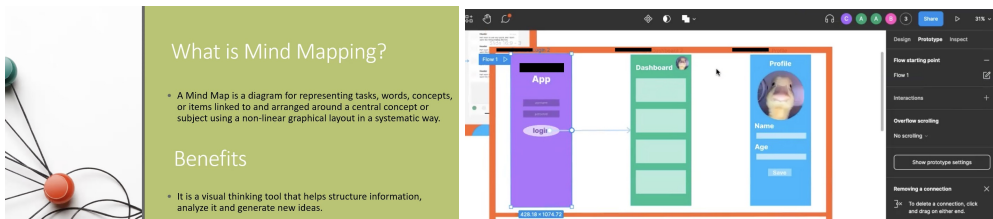


Fig. 2. a) Mind-mapping Training b) Figma Prototyping Training

3.4 Co-Design Online Safety Projects

In each workshop session, we carried out hands-on design activities where teens utilized the UX concepts in their individual UX projects. First, we had a brain-writing design activity on FigJam [33], where the teens were given a prompt about an online risk scenario and they built upon each other's ideas of features to navigate such situations. Teens later transformed these ideas into tangible interventions for online safety. After the workshop, we asked teens to create storyboards for their online safety projects (see fig. 3) using Canva [20] board with a template and instructions. Similarly, we engaged teens in creating user personas and mind maps for their projects by setting up boards on LucidSpark [49] with templates. We utilized break-out rooms to help them throughout the process, then reconvened so that teens could present their designs to the larger group for further discussion and feedback. Finally, teens created high-fidelity prototypes for their online safety projects. The teens presented their design projects on the last day of YAB.

3.5 Feedback on Study Protocols and Participation in Research Studies

Teens reviewed three ongoing projects in different research phases (see table 2). For *Study A*, teens provided feedback on a web-based online risk detection dashboard in its initial development phase. It proposed to improve the accuracy of its risk detection model by having youth participants upload their social media data and then evaluate the AI-detected risks in their data. We briefly introduced teens to the system via a quick video demonstration. For *Study B*, teens reviewed a study ready

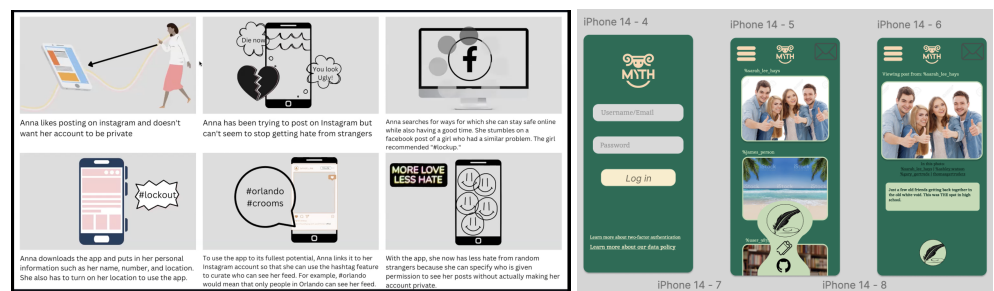


Fig. 3. a) Teens’ storyboard for online safety design idea b) Teens’ high-fidelity prototyping project for online safety

Research Projects	Description	Materials for Review
Study A	Early feedback on system development and social media data collection.	Quick Video Demonstrations
Study B	Focus groups for online safety designs feedback and pilot participation.	IRB Documentation
Study C	Post-study feedback on social media data collection and annotation.	IRB Documentation + Early Study Findings

Table 2. Description of the research protocols for teens’ study reviews

to launch, aimed at gathering teens’ feedback on online safety nudges through focus groups. We provided them with the Institutional Review Board (IRB) document containing an overview of the study activities, recruitment protocol, consent forms, and design artifacts. The YAB members also participated in the resulting research studies ($n = 6$) in groups of 2-3 teens, providing further feedback to improve them. For *Study C*, we involved teens in reviewing an already launched study focused on composing an ecologically valid dataset by collecting social media data from youth and allowing them to annotate it for safe or unsafe instances. For this study, in addition to the IRB documentation, we also shared the initial findings from the study to help them form their responses. Teens were given a set template with questions about the research to guide their written feedback for the study protocols. The questions included summarizing the purpose of the research, teen engagement, and any potential concerns about teens’ safety and privacy for participation. During the review sessions, we went through their feedback together and had an open discussion about the study and suggestions for improvement.

3.6 Final Presentation and YAB Feedback Sessions

On the final day of YAB, teens showcased their online safety UX projects. The presentations included: 1) the problem they were trying to solve, 2) their proposed solution, 3) the storyboards, user personas, and mind maps from the workshop activities, and 4) their prototype walkthrough. For the exit feedback interviews on YAB, we developed a semi-structured protocol containing questions related to their overall experience with YAB and the various activities we carried out during the YAB. Each interview focused on understanding the parts of YAB they enjoyed, the challenges they faced, and the areas for improvement, such as their thoughts on study reviews, co-design activities, and asynchronous research methodology. Finally, we thanked the YAB members for their invaluable contributions and wished them good luck in their future endeavors.

3.7 Data Analysis Approach

The data included audio/video recordings, feedback documents from study reviews, and design artifacts from the co-design workshops (e.g. personas, UX projects, etc.). We utilized qualitative thematic and feature analysis to identify themes pertinent to engaging teens in a long-term youth advisory board for online safety research and the resulting safety interventions. For RQ1, we qualitatively coded the written study reviews to understand the major aspects that teens considered important when conducting adolescent online safety research, such as breaking the chains of standard research practices that limit teens' participation, empowering teens with opportunities for more meaningful contributions, and choosing optimal research stages to involve teens (see table 3). For RQ2, we did a feature analysis of their design artifacts to examine the various solutions teens devised for their online safety, ranging from *incremental* approaches (e.g. advanced privacy settings) to more *disruptive* ones (e.g. decentralized social media platforms). For RQ3, we drew qualitative themes from the reflective feedback on YAB, including their positive experiences (e.g., enhancing design and research skills), challenges faced (e.g. losing momentum over time for long-term engagement), and suggestions for improvement (e.g., smaller wins for continued engagement). The first author went through the transcripts and designs to create an initial codebook. The codes were reviewed, refined, and finalized with constant guidance from the last author and the research team to form a consensus. After the coding was completed, the research team convened to conceptually group the codes into themes presented in the paper.

4 Results

This section summarizes the themes that emerged during our data analysis to answer each of our research questions, along with direct quotes from the participants. Please note that when we say "teens" in the results, they refer to our YAB members.

4.1 Reinventing Standard Research Practices with Increased Autonomy and Opportunities for Power-Driven Contributions (RQ1)

The YAB members shared strong opinions on standard research practices (e.g., IRB requirements, including parental consent, etc.) and desired deeper engagement in research for meaningful contributions. Moreover, we identified a variation in the teens' feedback based on their level of involvement in different stages of research. Below, we further unpack the teens' ideas and aspirations for online safety research.

4.1.1 Teens pushed back on standard research practices demanding more decision-making power. The YAB members challenged standard research practices that compromise their voices in online safety research, discourage participation, and limit their ability to express their ideas. The teens often expressed concerns that requesting **parental consent threatened their data confidentiality and hindered research participation**. They feared that the need for parental consent implied their sensitive information could be compromised and communicated back to their parents. To protect their boundaries, some teens needed a clear agreement that their research data would not be disclosed to their parents. For example, P4 critiqued the study documentation for lacking explicit statements restricting parental access to data, which might deter him with valuable insights from participating, as he said:

"I feel that the gray area described in confidentiality between the teen assent form and parental consent form will turn many teens with potentially unique sources of data away. The lack of anonymity and clear boundaries on secrecy,..., will appear as a risk, especially when a teen's parents are involved" - P4 (17-year-old, Male)

Furthermore, the teens explained that the requirement for parental approval could magnify the potential risks associated with participation, such as discussing sensitive topics or sharing personal risky experiences. It might introduce hesitation to discuss the research with their parents, worrying about their reaction. This directly inhibited the teens' authority and decision-making power regarding their participation in research, and consequently, some teens felt that such obligations made research less accessible. For example, P2 expressed:

"The lengthy yet necessary risk awareness might pose as a discouragement as it requires signatures from a parental figure and therefore less accessibility." - P2 (17-year-old, Male)

Given the sensitive nature of the information gathered about their risky online experiences, the teens were generally doubtful about the safe handling of their data. Although they applauded teen assent forms for providing the data privacy approach, they were not completely satisfied and needed *more details and assurances regarding privacy and security* of their data to ensure their rights and concerns were respected. Some teens emphasized that failure to develop teens' trust in the research could lead to distress, insecurity, and embarrassment in sharing such private details, thereby, discouraging their participation (e.g. *"The one concern that teens may have is whether their data will be shared publicly, as it is confidential and very personal"* - P1 (16-year-old, Male)). The teens felt this could only be addressed by assuring that it would be a safe space, outlining all the measures taken to ensure their data would remain private and non-identifiable at all costs. Furthermore, P3 suggested that it should be stressed that their data would not be shared publicly:

"You have the researchers ensuring the participants, like what they're going to do to protect their privacy and how data won't be shared outside of the study. I think that'd be the best case you could do." - P3 (15-year-old, Male)

As such, our YAB members acknowledged the need for study details that promote security and transparency to help make informed decisions, but they wanted it to be presented and disseminated in a digestible manner. They didn't endorse the idea of providing hefty forms flooded with information for recruitment purposes that might overwhelm teens and **preferred easily comprehensible documentation** with better organization. The teens felt that impactful and valuable information might get buried within extensive and lengthy material, causing barriers to access and hindering teens' participation. For instance, one teen shared: *"The recruitment process for this study is lengthy which may discourage the teen from registering."* - P6 (15-year-old, Female).

Additionally, some teens envisioned having liberty in how they wanted to interact and convey their ideas during the research studies. They proposed improvements that required **research to be more flexible and open-ended**, rather than rigid in its structure and activities. For co-design activities, the teens wanted to explore and experiment with the design ideas instead of strictly adhering to study requirements. For instance, P7 desired more time to formulate effective responses:

"Give me like more time to really think about it, and really examine whatever method, I was looking at so that I was able to give more input." - P7 (16-year-old, Female)

As a result, our YAB members deemed design activities to be rushed, limiting them from developing well-thought-out responses. On similar notes, they considered interview questions too formal, making it hard to escape the feeling that data was being collected. Moreover, they felt that restricting teens to predefined scenarios could alienate those who cannot relate to the specific situations. Therefore, they desired research to adopt a more conversational style based on teens' unique experiences, fostering open dialogue and spontaneity.

4.1.2 Teens sought authoritative roles in research for meaningful contributions. As the YAB members defied traditional research practices, they pushed for greater decision-making power and deeper involvement in study design and execution to make more impactful contributions. Being the focal

point of the research, the teens mostly wanted to have more **deeper conversations about shared experiences among themselves**. They suggested adding more questions and prompts focused on eliciting teens' unique online experiences to spark in-depth discussions, leading to rich insights and findings. (e.g. *"a question like 'what is your biggest concern with internet safety and how do you think it could be solved' is asked to the teens by one of the researchers and then the teens openly discuss amongst themselves for a set amount of time."* - P3 (15-year-old, Male). They emphasized the importance of teens feeling heard, which fosters honesty and openness:

"I would make a change to make teens more welcome and engaged in the study by adding more questions and discussion so the teen can talk about their feelings or how they were impacted by the negative experience with someone on social media." - P1 (16-year-old, M)

For studies that involved co-designing safety interventions, the YAB members aspired to be equal partners in the design process. They desired opportunities to influence every step and closely scrutinize solutions for efficiency and usefulness. In this light, they wanted **interactive engagement with the online safety design solutions**, developed as part of the research, to **understand their underlying workings**. They were eager to try them out to identify improvements. Some members felt it necessary to gain a sense of their potential impact. Also, it was considered a good practice to gain early feedback on how the designed technological intervention would be used in a risky situation without any instructions, as P6 explained:

"I would add that if a prototype was created, ask the teen to test it out and see what they would do in the situation with no guidance. This may help evaluate what teens may do if no help was available." - P6 (15-year-old, Female)

Similarly, the YAB members suggested providing tangible examples of how the interventions would operate in practice, rather than just describing them in words. They believed that showcasing scenarios and contexts in which these solutions would be used could enhance their understanding and facilitate effective evaluation.

4.1.3 Teens' feedback varied based on the research stage and their level of involvement, with hashed-out study designs and active participation working best. Across the study reviews, we noticed a stark difference in the feedback provided by the YAB members based on when and what level we involved them in the research. We observed that they were **more skeptical when provided with limited details about a preliminary study (i.e. Study A)**, stemming from their perception that they lacked sufficient information to critique. With just a high-level idea about the system, most teens asked many intriguing questions to better understand its functionality, including specific mechanisms and operational processes. However, some YAB members made assumptions due to the limited information available. Consequently, they were uncertain about the accuracy, effectiveness, and adaptability of the system, which barred them from trusting the system and from recognizing its ability to address online safety concerns:

"However, the application may have some faults in the design. Does the detection system always change to adapt to new circumstances? I'm wondering if a red flag might not be noticed when the scan is run." - P6 (15-year-old, Female)

On the contrary, the YAB members were more upfront in criticizing the granular details of the study, such as **the quality of interviews and engagement strategies, given elaborated study designs (i.e. Study B and C) and their participation in the research (Study B)**. First, they scrutinized the recruitment processes, critically flagging deterrents to research participation. Additionally, as they also participated in the study, they were more concerned about the study's goals and improving the participants' experiences. To this end, the teens shared concerns about

the scenarios and interview questions being repetitive and too formal, as one teen said: *“Scenarios were repetitive they’re going back to the questions and looking at it, the text messages and all that was repetitive”* – P3 (15-year-old, M). Leveraging the initial findings from the launched study, they were prompted to focus on issues raised by the participants and explore possible solutions. For instance, P7 highlighted that participants dropped out due to privacy concerns and suggested increasing efforts to build trust:

“There were a few people who chose to discontinue the study because they felt like the study was too intrusive, which is a very valid reason, as their information would be looked at by more than one person’s eyes. What I would change in this study is to basically overstress that privacy is kept as the number one priority throughout the whole experiment.” – P7 (16-year-old, Female)

Furthermore, they felt closely involved in exploring and assessing the design activities presented in the research. Their close interaction with these processes sparked their interest in the design ideas being developed as a result. Subsequently, teens desired long-term involvement, eager to further iterate on and evaluate them.

4.2 Designing Online Safety Solutions that Promote Digital Resilience and Equity (RQ2)

We further empowered our YAB members as active contributors to online safety interventions, by guiding them in leading their own online safety projects. From defining the problem to designing solutions, they actively applied the UX concepts learned in the workshops, generating 14 design ideas. They created user personas to illustrate teens’ social media concerns, developed mind maps and storyboards to outline the flow of their ideas, and finally designed prototypes in Figma. Mostly, teens designed solutions that addressed the injustices of social media in meeting their online safety needs, along with the associated online risks, such as phishing, hacking, information breaches, and social media addiction. However, alongside safety interventions, some members (N=2) pursued fitness-tracking apps to combat sedentary lifestyles fostered by social media, while still considering online safety in their designs. Overall, their design ideas encompassed two main streams aimed at enhancing teens’ online experiences through 1) **incremental changes** suggesting supplementary features to improve safety on existing social media platforms, and 2) **disruptive changes** envisioning new platforms that would reshape online safety through teens’ agency and empowerment. Below, we delve deeper into the ideas conceptualized by teens and the underlying considerations they made during the process.

4.2.1 Teens criticized social media platforms for insufficient online safety options and proposed incremental changes to empower them in managing risks more effectively. The YAB members designed features to improve the current social media platforms (N=9) such as advanced privacy settings and safety nudges for autonomous decision-making, as elaborated further in this section.

Add-ons for advanced settings in social media for granular privacy and security controls: editThe YAB members shared that social media platforms offer limited privacy controls that inhibit them from fully enjoying their benefits. For instance, P6, mentioned that teens want to have a public presence on social media to freely express themselves, increase reach for their content, and connect with broader communities. However, they were dissatisfied with the limited control over their content getting viral without their consent, exposing them to uninvited hate speech and safety risks. They stated that such concerns lead them to a dilemma — wanting a public presence but also needing autonomy and privacy safeguards to protect them from the potential harm of maintaining public identity. P6 emphasized:

“Some people don’t want their account private, and their decision should not influence whether they go viral or not. Everyone has a choice.” – P6 (15-year-old, Female)

To overcome these issues, they designed an add-on feature in the privacy settings that allows teens to **curate content using personalized location-based hashtags** in their posts restricting them to be viewed only within the hashtag range. To customize and manage the hashtag collection, they created a separate application, which could be accessed across multiple platforms with user permission. They assumed platforms could accurately curate content based on hashtags and grant access to a third-party application for managing hashtag collection. While they suggested location-based hashtags for now, they believed that the idea could be evolved by testing out different sets of hashtags and held the potential to restore agency and justice to teens over their public content.

Furthermore, P3 shared that most teens want to have both a public and private presence on social media as it allows them to curate content for diverse audiences while prioritizing their safety. However, having a dual presence requires them to create two separate accounts, which is inconvenient and can lead to increased hacking and security risks as they tend to use the same password across multiple accounts. On the other hand, strategies like restricting access to close friends only are ineffective as teens desire content on their public and private accounts to be curated differently according to their specific audiences:

"On insta or Facebook, you can pick your close friends but that doesn't reflect on the whole account...I also want to make my explore page (for both accounts) more personalized because the algorithm works based on like who you follow,... what they share with you and all that kind of stuff." - P3 (15-year-old, Male)

To mitigate this issue, P3 designed an add-on feature in the privacy settings that allows teens the option for **dual feeds (i.e. both private and public) within a singular account** (see fig. 4). For both accounts, teens can customize their interaction settings, such as deciding who can view, or like their content. After enabling the advanced privacy option and setting up interaction levels for each account, a toggle button would appear on their profile, allowing seamless switching between the two feeds. For implementation, they emphasized the need for effective segmentation and nudge warnings to prevent content from being shared on the wrong account.

Automated risk detection with safety nudges embedded within social media for stranger danger prevention: The YAB members were most concerned about the risks posed by interaction with strangers online including doxing, phishing, scams/bots, explicit/violent content, harassment, and information breaches. For instance, P2 shared being approached by strangers and asked for sensitive information like their contact number. They strictly refused these requests and blocked or reported the individuals to end contact. However, in some situations, the individuals would remain persistent and blackmail/threaten teens to manipulate or gain from them.

"They ask for sensitive/inappropriate information and if teen poses resilient, they would threaten with address, info, I have to restrict my messaging permissions until the issue stops"- P2 (16-year-old, Male)

In such situations, the teens felt there were insufficient safety measures, as they sometimes had to repeatedly block or report accounts from the same individuals, exhibiting unjust behavior of these platforms in keeping teens safe online. The teens suggested automated detection of risks and nudge warnings to encourage proactive behavior and promote better decision-making (see fig. 5). For instance, P4 suggested **dynamic flagging and privilege restriction of users** based on their conduct. First, users would be automatically scored depending on the severity of offenses they have committed to reinforce community standards and timely awareness of potentially harmful users. According to users' scores, their levels of online privileges would be determined. Those with lower scores (e.g., below three indicating no offenses or minor offenses) would receive unrestricted or moderately constrained privileges. In contrast, users with high scores (e.g., above three indicating major offenses or malware offenses) would face severely restricted privilege, P4 elaborated:

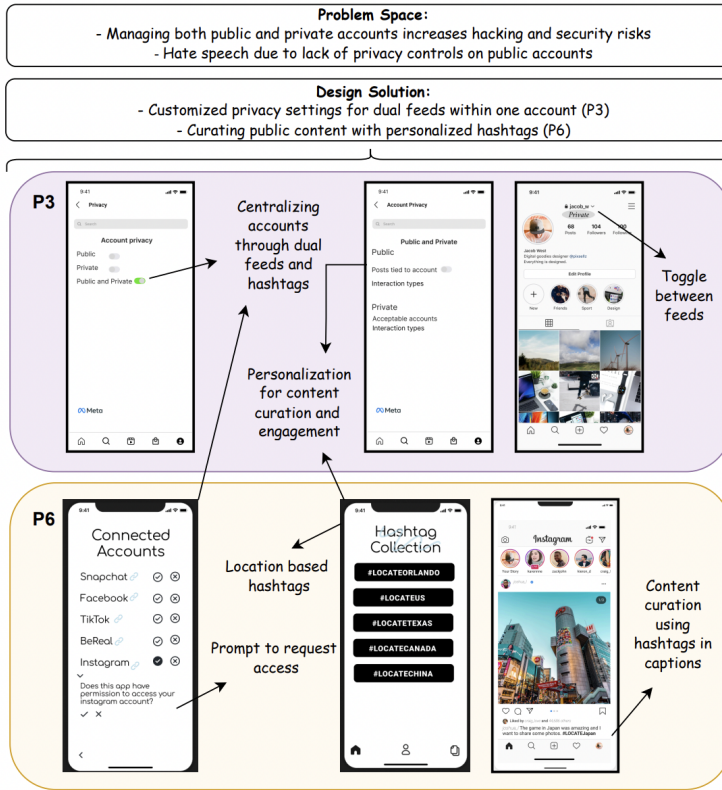


Fig. 4. Add-on features for advanced settings on social media for enhanced privacy controls

"For instance, a user with score three for major offenses, like doxing, threatening messages with other, will face restrictions being unable to use certain restricted key terms or requiring approval from admin"- P4 (17-year-old, Male)

Similarly, the YAB members devised interventions to detect risky messages in private messaging on social media platforms, triggering nudges to enhance their control over online safety. For instance, P1 created a nudge design **alerting teens of possible scams and frauds**, cautioning them to be mindful of potential risks in their interactions. Moreover, teens also designed safety warnings for **information breaches** (P2, P6 and P2) and **explicit content** (P3 and P5). Apart from risk detection and generating warnings, teens advocated for **advanced protective measures** to navigate risky situations (P2, P3, and P5). They shared that blocking malicious individuals can sometimes backfire, as they might become more persistent if they realize they've been blocked. Additionally, reading messages from a malicious stranger could encourage them to continue pursuing and hoping for a response. Therefore, they requested an **option to 'ghost' the individual automatically**, silently dismissing interaction without alerting the other person. This would prevent escalation while giving users more control over managing unwanted contact. In cases involving high risks, such as sexual harassment or life-threatening situations, the teens emphasized the need for platforms to take immediate action by **generating detailed reports**, capturing complete message history to be **shared with local authorities or police** for rapid investigation and scrutiny of the offender.

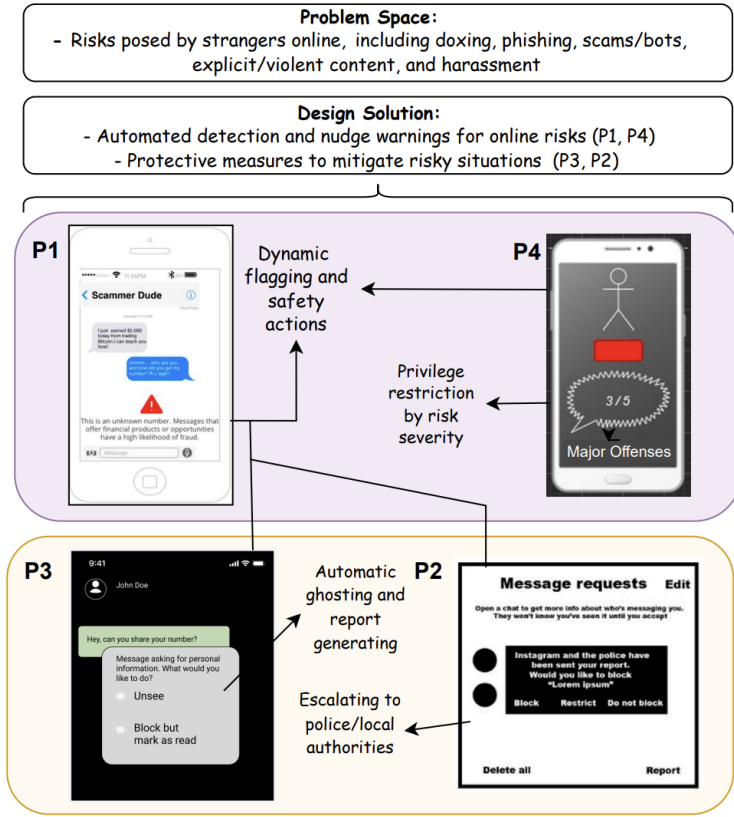


Fig. 5. Automated risk detection with safety nudges embedded within social media for stranger danger prevention

4.2.2 *Teens resisted the existing online status quo, advocating for disruptive changes in the form of decentralized social platforms that prioritize teens' agency and empowerment for online safety.* The YAB members argued that current platforms offer limited capability to protect user's private information, leaving teens vulnerable to data breaches and online threats. Moreover, they voiced their disappointment on current social platforms that consistently prioritize their profit through addictive engagement metrics over meaningful connections, privacy, and safety. Instead of fixing flawed systems, the teens advocated for new digital spaces (N=5) that reflect their values of agency, trust, and empowerment.

Empowering teens with apps to enhance management and protection of their private information: The YAB members shared that teens use various platforms, which require them to manage multiple login credentials. To make the process easier and more convenient, they tend to use the same/weaker passwords, exposing them to hacking risks and identity thefts. P5 explained that teens lack adequate tools or knowledge about secure password practices and their importance, resulting in unsafe habits. They conceptualized a **password management application** that not only **stores or suggests strong passwords across platforms**, but also empowers teens to follow safe practices. To do so, it would **track password usage across multiple platforms and force**

them to change repeated passwords while providing information to learn why it's needed (see fig. 6), as P5 said:

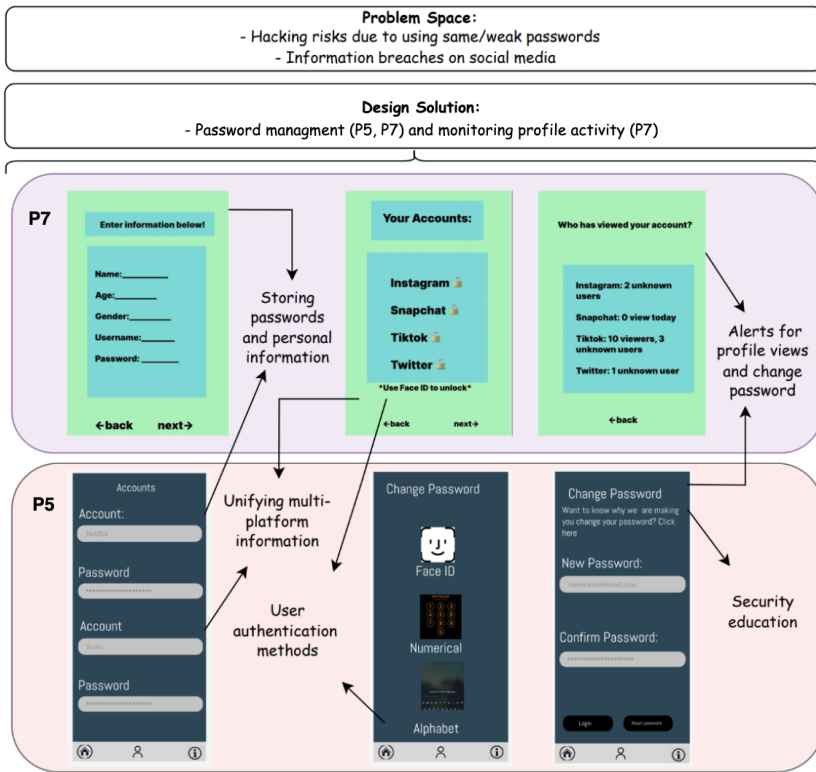


Fig. 6. Apps to enhance management and protection of teens' private information

"I use the same password for more than one account it would kind of sent me like a reminder thing, more like a notification that's saying like, Oh, like you've already used this password, like then would force you to have like a different password for every single account that you own." - P5 (17-year-old, Female)

Similarly, P7 designed an application for storing/protecting passwords and other personal information like usernames and age across multiple platforms. They included a feature that **monitors teens' profile activity across platforms and generates reports to alert users** when their profile or private information is accessed or a hacking attempt is detected, introducing new expectations for privacy. That way, teens can keep track of their accounts and know who to block in advance to protect themselves from potential risks. Yet, teens shared that such apps would require accurate algorithms for data tracking, and detection of repeated/weak passwords to give recommendations. Moreover, they also emphasized the necessity of building trust through robust data privacy policies, ensuring that their sensitive information is securely handled and well-protected.

Decentralized platforms with increased teens' agency and simplified features for community building: The teens berated social media platforms for their endless greed to maximize their profits through adding deliberately addictive, and entrenching design elements, exploiting users' view time and promoting continued engagement. From user metrics such as views, likes, and

followers that create societal pressure, to doom-scrolling driven by the endless stream of content pushed by these platforms, teens feel hopelessly trapped in unhealthy patterns of social media use that tremendously impact their mental health and overall well-being. To this, P4 added:

"Platforms like YouTube and TikTok have become famous for how their content curation algorithms can send users into life-altering cascades of potentially harmful content... I treat such pipelining as a societal risk." - P4 (17-year-old, Male)

To retaliate and reclaim their rights, P4 designed a **platform that affords viable sharing and viewing of information without the mechanics that include unhealthy behavior**. It was envisioned as an open-source passion project being maintained by supporters who are not interested in monetization. Interestingly, they also pitched making accounts private by default and limiting content browsing through accounts that achieve mutual following only. They wanted to add interest tags to their profiles to enhance discoverability and build connections with like-minded individuals. They revised social media features, including making the follows and comments invisible from others and disabling receipts on direct messages to reduce societal pressure. Introducing elements of transparency, P4 designed a data policy allowing users full control over how their data is being collected and protected using an authentication key without which no one can access their data. Moreover, any changes or additions of new features would be made by consensus within the community. However, P4 highlighted how this may pose a difficulty as achieving consensus can be challenging due to diverse opinions, and conflicting interests. Nevertheless, they believe that having de-gamified social platforms would empower teens to regain control over their online habits.

The YAB members also expressed challenges in staying healthy due to the sedentary lifestyle governed by technology/social media, leading to decreased physical activity and increased screen time. However, they accepted that technology, mainly social media, has become an inevitable part of their lives. Therefore, two teens (P1 and P2) decided to use it to their advantage and conceptualized **fitness-tracking apps with social feeds with limited interaction to foster community building and motivation**, encouraging people to be more proactive about their health (see fig. 7). Their idea involved connecting wearable devices, such as smartwatches, to the apps. These apps will then monitor their physical activities, and provide personalized recommendations.

"It will also track person's daily steps and calories, so it can provide personalized recommendations to help a person stay healthy." - P2 (16-year-old, Male)

Additionally, teens can share workouts and view others' workouts on the feed. However, they wanted the accounts to be anonymous by default. Through this approach, they wanted to create a safe and judgment-free environment, while retaining control over their data and how they present themselves. They also preferred to have limited interaction levels with the posts on the feed, such as disabling comments or sharing options, to reduce the pressure of social validation and prevent potential negative interactions. They acknowledged that such an app would require robust algorithms for accurate data tracking for personalized and effective recommendations.

4.3 Reflective Feedback on the Youth Advisory Board For Empowering Teens Effectively

The YAB members shared detailed feedback, highlighting the positive aspects such as the valuable skills they developed, and the challenges they faced, including inadequate support for teens' diverse interests and losing momentum over time. Additionally, the teens offered actionable suggestions for improvements. Below, we further unravel the key points they shared regarding their experience in the program.

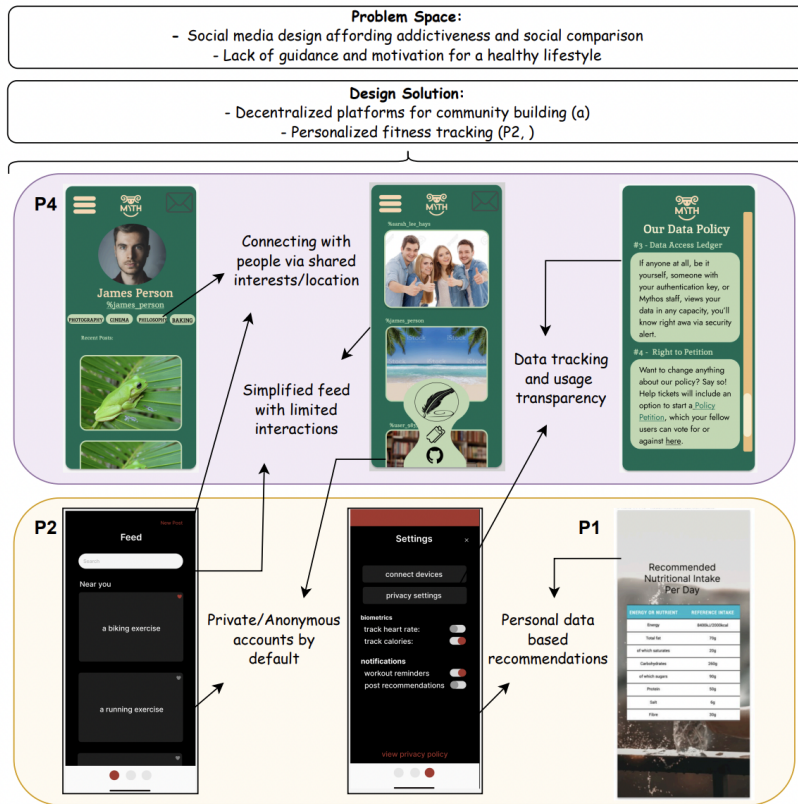


Fig. 7. Decentralized platforms with increased teens' agency and simplified features for community building

4.3.1 Teens expected more balance in activities to accommodate their diverse and competing motivations and interests. Our YAB members had differing motivations for joining YAB, where most of them wanted to **build their career profiles for long-term benefits** by learning new skills. Some wanted to explore different aspects of UX design and its applications, to assist them long-term with future educational and professional endeavors. Others were interested in the research side which would help boost their college profiles. In addition, some teens were looking to develop connections with people in this area before going off to college. Along with personal growth and learning, they were excited about **contributing to online safety research** by sharing insights.

Subsequently, some members liked the design activities and the career sessions, as they **enhanced their UX design skills** which provided the foundational basics to further explore the field. It helped them brush up their communication skills as they interacted with the researchers and other team members. The design activities equipped them with the skills to present and visualize their ideas. On the other hand, some teens were more interested in study reviews as they loved critiquing and giving input on research protocols to generate new knowledge. They expressed that engaging in the discussions about the research studies allowed them to exchange diverse perspectives. It **allowed thinking deeply about online safety concepts** and learning the different opinions of people in certain situations.

As such, the YAB members wanted us to acknowledge their individual preferences and **balance design activities with research-based thought work**. Some teens suggested having smaller groups working individually based on common interests and then having a larger meeting to share their work. At times, this **differing preferences were tied to varying needs for support** based on teens' level of technical expertise. Some members needed more proactive guidance and mentorship in navigating the design tasks, such as frequent tutorials on Figma and hands-on project help. Whereas other teens found the design tasks to be tedious and time-consuming due to a lack of interest, as they wanted to be involved in "thought work" related to research goals:

"But to an extent I feel like learning how to use figma took up more of our time than it should have...I would have preferred using that time less on this on learning how to use figma and more on the the I guess technical aspects like the studies and like thinking about certain questions" - P2 (16-year-old, Male)

Subsequently, some teens focused on improving their experience of reviewing research studies. They suggested making research content more digestible, interactive, and easy to follow by providing short summaries of the studies they were required to review or visual elements to understand the concepts. They felt the need for more discussion sessions after providing feedback on the research protocols to discuss their concerns and questions. Interestingly, they shared the need to see how all the studies were connected to grasp the big picture of teens' online safety research. Overall, the YAB members desired increased support and space to help them explore and develop their unique interests.

4.3.2 Teens appreciated their long-term engagement but lost momentum over time. The YAB members shared that their **long-term engagement** led to deeper and more meaningful contributions as it helped form more intellectual and well-thought-out responses. They shared that engaging for a longer period cultivated a better rapport with researchers, assisting them in comfortably communicating their ideas. Moreover, having research activities spread out over the year made it easier for the teens to manage them with their other commitments. Frequent discussions on online safety concepts led them to internalize these ideas, making them better digital citizens and guiding them to be cautious in their online interactions:

"I think it just made me more acutely aware, being part of the research made me more aware and made me pay more attention to the kinds of potential safety breaches that you might encounter on social media, how I should behave when using the platform" - P4 (17-year-old, Male)

At the same time, our YAB members pointed out the challenge of **losing momentum over time**. They shared their concern regarding the cancellation of meetings due to low attendance which made the meetings sparse leading to gaps in achieving the end goals of the program. The teens acknowledged that it was difficult to schedule meetings owing to the varying teens' schedules, but long-term research requires persistence and irregular meetings affected their long-term commitment to the program. Therefore, they suggested having a fixed meeting schedule communicated at the beginning of the program. They also recommended having stricter participation rules, including penalties for unexcused absences or late tasks:

"I think you guys implemented this late where like, if you don't attend meetings, you don't get paid. Maybe you should have done that from the start. So it would motivate people to actually go to meetings or like, prioritize. I feel like that should have been done." P6 - (15-year-old, Female)

To keep them engaged and enhance the quality of their work, the YAB members pressed on the necessity of **learning about the contributions of their participation**. They wanted the team to

report back the research outcomes to see how their contributions made a difference to the online safety of teens. To mitigate these concerns, the teens suggested developing an alumni mailing list or newsletter following the program's completion, keeping them informed regarding the impact of their contributions. Similarly, they wanted to see the implementation of their design ideas on social media platforms and suggested inviting developers from the industry to assess their ideas as they are the ones who are responsible for modifications in the systems.

"These are the people that ultimately determine what you see and what you don't...So having the, the voices be heard by the people that actually dominate the UX engineering space, I think is absolutely important." - P4 (17-year-old, Male)

The teens also required **smaller wins for continued engagement** in the program through incentives. They highlighted the need for frequent task reminders and a manageable workload owing to their busy schedules. For instance, one teen suggested dividing the UX projects into multiple deliverables with their respective deadlines for smaller wins. Moreover, they recommended offering small but regular payments, not in the form of gift cards, to keep them committed to the research and ensure their continued involvement. They also suggested onboarding teens with diverse social media roles, for instance, influencers, bringing unique perspectives and experiences, and increasing their interest in the research.

4.3.3 Teens wanted to collaborate with one another but felt there were inadequate opportunities for engagement. Our YAB members also liked the **collaborative activities** in which they had to build off of each other's ideas to complete a task as it helped foster a sense of community and nurtured team-building skills. Relatedly, they appreciated the **flexibility of the ARC environment** as they could carry out the activities at their own pace and engage with others at a time of their discretion. However, the teens expressed that such activities were scarce and asked for **increased opportunities for peer-to-peer collaboration and rapport** among themselves. Although they developed a trusted connection with the researchers, they felt a lack of strong peer-to-peer bonds because of limited collaborative tasks. Similarly, while the teens enjoyed the flexibility and freedom offered by ARC, they believed it hindered peer interaction, as it often felt like submitting responses to researchers without much interaction among teens due to varying response times. P4 noted that this volatile nature could lead to a lack of accountability, compromising work quality.

"It can lead to a lack of accountability with the research of either doing it sort of haphazardly or last second, because you sort of forgot about it. These are, you know, errors that you need to plan for, if you're going to let people do it on their own." - P4 (17-year-old, Male)

To this end, the YAB members urged for more group activities, such as having them work in teams on online safety UX projects. They also suggested employing a combination of online and in-person meetings, as face-to-face interaction fosters a deeper connection. We saw that the teens proposed mandating interaction by requiring teens to respond to at least one other teen, with penalties for non-compliance. They suggested recruiting more team members to encourage diverse opinions and foster deeper discussions, as increased interaction could inspire and motivate shy teens to participate. One member recommended that as the research is about the online safety of teens, we should explore teens-driven problem solving where teens bring out different problems and other people (i.e. other teens and researchers) work together to design solutions for the problems.

5 Discussion

In this section, we discuss the implications of our findings and provide recommendations for teen-centered online safety solutions and long-term youth advisory board programs.

5.1 Teens as Co-researchers in Research Practices

While recent meta-research efforts with teens have provided guidelines for conducting online safety research [14], our approach of involving them as co-researchers to give direct feedback on research protocols further revealed systemic injustices within institutional frameworks that shape them. Our findings showed that teens resisted the standard research practices and desired for enhanced autonomous participation, extending beyond traditional design roles [93]. Interestingly, teens considered participation requirements like parental consent, intended to protect them as minors, to be privacy-invasive. This aligns with the longstanding tension between parents and teens, where parents often exert control over teens' online activities [3, 7, 90]. Our study showed that this dynamic extends to research participation, where parental consent requirements may further limit teens' agency and heighten their privacy concerns. As such, teens felt that current frameworks lack strong assurances of data privacy and security, creating uncertainty around data handling and confidentiality. However, institutional frameworks like IRB have inherent limitations, as complete confidentiality cannot be guaranteed due to mandated risk reporting for cases like self-harm or abuse^{2 3}. While these policies are in place to protect teens, they may also discourage participation, as teens shared in our study, or prevent them from openly discussing their experiences due to fear of breaches in confidentiality. However, growing research in neuroscience [63, 81] highlights that adolescents' decision-making is still developing, particularly concerning risk-taking behaviors. As a result, while teens can provide valuable insights, it is crucial to ensure that their autonomy is balanced with ethical standards to prevent potential decision-making biases. Therefore, we call upon future research to rethink traditional research practices and explore more equitable strategies with teens to ensure privacy, autonomy, and ethical compliance.

Our study found that teens wanted flexible study methods, leading to tailored, responsive research practices for teens. This echoes recent co-design efforts; for instance, Agha et al. [5] involved teens in evaluating risky personas on social media through interactive methods that provided more control, such as providing the freedom to create their own personas instead of just providing feedback on the existing designs. Moreover, unlike prior design justice research that has focused on involving teens in specific stages of research like co-design or evaluation [4, 11, 17], our study revealed that teens were able to critically assess procedural aspects when engaged across research phases, from ethics review practices (e.g., IRB) and study documentation to study design and execution, offering a comprehensive view of how youth want to evaluate online safety research practices. Yet, it is important to note that this critique of research processes and institutions is not meant to address all injustices. A key contribution of our findings is to depict the value of including diverse teens' voices to challenge and inform more teen-centered research practices. Therefore, our study extends prior CSCW work that calls for meta-level research [5, 14, 22], arguing that teens should contribute not only to design but also to institutional processes that often perpetuate systemic injustices. As such, we advocate for more collaborative and autonomy-centered research practices by emphasizing broader teen involvement.

Consequently, having teens as co-researchers helps evaluate and improve research quality by enhancing teens' agency and leadership, as documented in prior studies [9, 46]. Our work is among the first to involve teens in challenging traditional research norms and practices that can perpetuate and undermine teen voices, revealing that they can play an active role in establishing a foundation for future studies by offering valuable insights into study design and execution. Therefore, we

²<https://hrpp.research.virginia.edu/teams/irb-sbs/researcher-guide-irb-sbs/minors-research-studies>

³<https://www.tc.columbia.edu/institutional-review-board/irb-blog/2022/mandated-reporting-responsibilities-as-an-ethical-researcher/>

advocate for participatory research practices that position teens as co-researchers, supporting their autonomy and meaningful participation [36, 37, 77] in online safety research.

5.2 Implications for Design: From Incremental To Disruptive Technological Solutions for Online Safety to Empower Youth

While prior co-design efforts allow teens to collaborate in designing interventions [3, 11], we empowered them as co-researchers to take full ownership of their own projects, from ideation to execution. As such, they were able to drive the research process and devise creative solutions to various online risks based on their lived experiences. Our findings revealed that teens are aware of the risks of engaging publicly on social media platforms and suggested *incremental changes* such as advanced privacy settings to maintain their safety [7, 94]. This highlights the gap between platforms' restrictive teen-focused features and teens' desire for more agency. For instance, recently, Instagram introduced a "teens account" feature that sets all teens' accounts to private by default, allowing public presence only with their parent's permission⁴. Building on prior work on supporting teens' reflective self-regulation on social media uses [28, 55], we urge social media researchers and designers to offer teens decision-making power in managing their online interactions. Teens also suggested social media be proactive in assisting them to navigate risky situations through nudge warnings. Recent work has also shown that guided nudge is a promising solution, [2, 5, 55], but the novelty of our design ideas stems from tackling diverse risk types (e.g. scams, frauds, and phishing) that occur on a spectrum in terms of severity, and offering advanced protective measures that go beyond traditional blocking and reporting [5]. While social media platforms provide content sensitivity filters⁵, nudges provide generalized warnings regarding violations of community guidelines. Therefore, these platforms should implement advanced safety measures through nudge designs tailored to the specific risks teens face online.

Interestingly, our study revealed that teens are tired of social media platforms that consistently defy their needs. Instead, they are moving toward more *disruptive solutions* that seek "massive, disruptive change to industries" [16], demanding new modes of interaction and safety features. For instance, they pointed out the limitations of the platforms in protecting private information like usernames and passwords, desiring new apps to manage their privacy and security. While some password management apps exist⁶, teens felt they lacked features like reminders for choosing unique passwords and alerts for risky activities, such as information breaches. Moreover, as the prior concept of networked privacy highlights how teens navigate privacy within their interconnected social networks [54], our study shows that teens tried to manage such information flows across multiple platforms when no singular platform supported their privacy management well. Therefore, our findings underscore the need for an aggregated, cross-platform infrastructure that supports the privacy and security needs of teens. Moreover, as social media platforms maximize engagement by exploiting psychological triggers [56] and influence agency via ads or algorithms [50], teens from our study envisioned new social spaces with limited interactions that promote better mental wellness and meaningful connections. This is similar to prior work by Fan et al. [32], who conceptualized "Feelbook", a social media app for teens designed to help improve their online behavior and prevent cyberbullying. As such, we propose providing teens with new digital avenues for healthy interactions that foster well-being. Based on our findings, we outline design implications from incremental changes to disruptive solutions for researchers and platforms to develop justice-centered safety interventions that promote teens' freedom and decision-making power.

⁴<https://modernlearners.com/teens-in-public-online-its-complicated/>

⁵<https://www.techspot.com/news/68636-instagram-adding-sensitive-content-filter-enables-two-factor.html>

⁶<https://www.keepersecurity.com>

- **Incremental changes: Allow increased control over public content in place of restrictive approaches.** Allow teens to manage their content reach through location-based hashtags, which can be strategically selected, similar to how youth activists use hashtags to engage with and understand their audience [43]. Moreover, teens often post based on different social contexts and norms (e.g., audience) [79]. Extend the idea to allow for better curation of public content through location-based hashtags to give teens more power over their data management. However, supporting this might lead to further risks of revealing personal information or narrowing down the radius for predatory risks. Thus, partner with teens to understand how to balance their needs with effective privacy protections.
- **Incremental changes: Facilitate dual presence (private and public) for seamless interactions across different audiences.** Allow teens to have two feeds in the same account for easier management of private and public accounts. It mirrors the Instagram Flipside feature, which allows users to create an exclusive, private Instagram profile ⁷. However, it was discontinued as the complexity of managing multiple profiles confused users. Teens gave ideas to circumvent such issues, such as adding a toggle button on the user profile page for smooth transitions between two accounts. Therefore, collaborate with teens to understand their ideas and incorporate their feedback into future designs.
- **Incremental changes: Empower teens with guided safety nudges on social media as a first line of defense.** Implement guided nudges with additional safety options to ‘ghost’ malicious users without alerting them, generating reports of the offense and contacting local authorities for prompt action against the perpetrators. Moreover, implement dynamic flagging of profiles based on varying offense levels to prevent risks from occurring in the first place. This aligns with previous research indicating that risks occur on a spectrum [5], requiring tailored responses rather than a one-size-fits-all approach to safety measures. However, nudges can be overwhelming; for instance, Schluchter et al. found that mental health content on TikTok sometimes had a negative influence on users [71]. Platforms should offer customizable and context-aware nudges to balance support. Also, develop a system to prevent misuse of these features, ensuring reports are legitimate to avoid false accusations and resource strains.
- **Disruptive changes: Create new avenues for managing and protecting private information across platforms, featuring real-time monitoring and personalized risk alerts.** Develop advanced tools that combine password management with real-time monitoring and personalized alerts, helping teens make informed decisions about their online safety. However, there is skepticism regarding the safety of personal data fueled by concerns that phones are “listening” to conversations and tracking user behavior ⁸, as well as uncertainty about who has access to their data [34], which may hinder the adoption of such security tools [73]. Therefore, be more transparent about their privacy practices to build trust and offer assurances to the teens.
- **Disruptive changes: Develop decentralized platforms that prioritize healthy interactions while enhancing teens’ autonomy instead of exploiting them for profit.** Introduce new social platforms stripped of user metrics such as likes and comments and the influx of content, moving away from the addictive features. BeReal is one such platform [67], which encourages users to share authentic content and exercise more agency without judgment. However, there are practical challenges associated with such solutions. For instance, a lack of business incentives might inhibit the sustainability of such platforms. While teens

⁷<https://zerogravitymarketing.com/blog/the-rise-and-fall-of-instagram-flipside-feature/>

⁸<https://us.norton.com/blog/how-to/is-my-phone-listening-to-me>

expressed optimism about such platforms being community-driven projects, they can not rely on volunteer contributions for long given the technical challenges involved. Social media platforms could work with teens to find a middle ground and offer tailored versions to teens based on their unique needs.

5.3 Implications for Long-Term YAB: From Niche Groups for Teens' Individual Interests to Boosting Community Engagement through Increased Collaboration

Past research has struggled with power imbalances between teens and adults, where adult perspectives often overshadow those of teens [22]. Building on recent justice design efforts [11, 12, 22], our YAB engaged teens as co-researchers in both refining research practices and designing solutions from scratch while also gathering reflective feedback on the YAB process itself to inform future research. We found that our comprehensive and long-term approach helped teens gain a better understanding of online safety concepts, leading to deeper contributions and highlighting unique challenges that teens face in traditional research methods. Therefore, unlike prior research that mostly uses "one-off engagement" with teens to co-design safety solutions [6, 27], our study showed the value of engaging teens for a longer period. We also found that teens had varied interests and needs; some enjoyed design activities and requested more technical support, while others preferred study reviews and required more interactive ways to engage with the research. This challenges the one-size-fits-all approach of traditional co-design methods that overlook individual preferences by relying on standard activities that don't address diverse needs [3, 12, 22]. Therefore, we call for researchers to devise ways to provide help and guidance according to teens' individual needs to maximize their benefits while encouraging meaningful contributions to the research.

Moreover, as teens got busier, they lost momentum due to scheduling conflicts and time management issues. They commended ARC methodology for working on the research tasks at a time of their discretion, as also recommended by previous work [17, 51]. However, they also suggested stricter rules for attendance and task completion, similar to a school setting. Teens also wanted manageable milestones and regular payments for continued engagement and motivation [9, 46]. Future researchers should work with teens to seamlessly integrate program goals into their lives, balancing flexibility through ARC with stricter accountability, frequent reminders, and consistent check-ins. Teens also felt a lack of group activities and grew distant from each other resulting in poor rapport and engagement among themselves. Therefore, future programs can plan more group activities, as also suggested in prior research [6, 46, 90], to help maintain long-term engagement and bridge individual differences by enabling participants with diverse knowledge and skills to collaborate toward a common goal. Some engagement lags were due to logistical issues, where the director of our YAB program (the last author) transitioned to a new university. Although we maintained the same YAB remotely, keeping them engaged was challenging due to personnel changes and transitioning IRB approvals. Therefore, we emphasize the importance of maintaining continuity within the research team.

Also, teens were eager to see the impact of their work on online safety and expressed a desire to present their ideas to developers to shape technology. Past research [3, 14] also shows that teens argue for open collaborative systems that invite more stakeholders like social media platform owners and engineers to join the conversations with teens [1, 30]. However, we must acknowledge the limitations that might follow, such as constraints related to time, resources, and the developers' ability to implement all suggestions. Therefore, balancing teens' input with practical considerations will be crucial to ensure a productive collaboration in future research. Based on our findings, we provide the following guidelines for establishing effective long-term programs with youth as research partners:

- **Define roles and niche groups based on individual interests and preferences early on:** Form groups of teens based on their unique interests and motivations and provide tailored support to help them achieve the research goals (e.g. additional support design-based activities, interactive elements for greater interaction with thought-based tasks).
- **Facilitate the alignment of research goals with teens' daily activities to ensure beneficial outcomes:** Integrate such programs as research incubators within schools, offering academic credit or monetary rewards to motivate participation and enhance college applications. Provide frequent reminders and establish stricter rules to enhance accountability. Assist them with calendaring to stay on track.
- **Leverage ARC spaces with gamified elements for flexibility and engagement:** Utilize a combination of synchronous meetings with ARC spaces [52] to carry out research tasks with convenient engagement. Explore gamification elements to make collaborating in ARC more enjoyable, for instance, create challenges rewards, or competitions to motivate discussions and engagement among teens.
- **Foster collaboration through increased group activities to address diversity:** Allow working on UX projects in groups to bring together their unique skills, and perspectives. Facilitate teen-led problem-solving activities for collaborative learning and skill development.
- **Facilitate continuous engagement through manageable tasks with regular payments and updates on the impact:** Divide larger goals into smaller milestones and release payments upon completion. Employ iterative research approaches to get continuous feedback and communicate impact effectively. Invite developers to actively interact and give feedback on their ideas, with potential collaboration opportunities.

In summary, our study serves as a guide for employing effective approaches to involving teens in online safety research while also considering their expectations to help them grow professionally.

6 Limitations and Future Work

We recognize some limitations of our study that may have shaped the nature of our findings. First, we acknowledge the potential for sampling bias due to participant self-selection. While our YAB members were racially diverse, they were also generally well-educated, more digitally literate, and highly motivated to engage in online safety topics and design processes. As such, we also acknowledge that full co-researcher involvement does not equate to a just approach as it depends on various contextual factors, including socioeconomic and educational backgrounds, as well as profound marginalization due to intersectional identities such as LGBTQ+ youth [70, 80]). Consequently, our findings may not be generalizable to all youth populations, especially in non-Western contexts. Future research should consider involving teens from more diverse backgrounds and cultures to have more enriched and unique perspectives. Secondly, our sample size was intentionally kept small to ensure effective monitoring and to provide personalized attention to each YAB member. Moving forward, researchers should consider sustainable ways to engage more teens, but it is important to maintain a balance with the number of researchers, as managing a large team can be challenging. Lastly, our study provides guidelines for developing effective online safety solutions and long-term youth advisory board programs in the specific context of adolescent online safety. Researchers may employ strategies from our lessons learned to form their own YABs, but they would need to be adapted for the specific context and demographics of the teen YAB members.

7 Conclusion

Amid the long-standing struggle to shift from restrictive to resilience-based approaches, we often overlook the standard practices in online safety research that restrict teens' participation and limit

their engagement. Our findings reveal that teens' voices are still subtly suppressed through requirements like parental consent, rigid study guidelines, and research practices shaped by institutional mandates. In addition, teens are also frustrated with merely patching existing platforms through incremental changes. Instead, our work advocates for revolutionary changes that open new spaces for meaningful connections, stronger privacy, and healthier content consumption, fostering teens' autonomy to manage their online safety. We urge the development of long-term partnerships with teens, that balance protection with autonomy, to ensure their involvement at every stage in shaping effective, teen-centered online safety solutions.

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A Qualitative Codebook for RQ1 Findings

Table 3. RQ1: Teens’ Considerations for designing more just and equitable online safety research studies

Themes	Subthemes	Study	Exemplary Quotes
Teens pushed back on standard research practices demanding more decision-making power	Parental consent threatens teens’ confidentiality	B, C	<i>“I think it should spell out in very plain terms that parents cannot reclaim experiences or data declared in confidence by surveyed teens.” – P4 (17-year-old, M)</i>
	Teens prefer easily comprehensible documentation over lengthy materials	B,C	<i>“Although the forms are needed for security and success, it may seem like too much in the eyes of a teen.” - P6 (15-year-old, F)</i>
	Teens want research to be more open-ended	B,C	<i>“They should be able to suggest changes using post-it notes or have their own personal copy of the “method” which they can respond to and the research overseer can watch as a collective.” – P2 (16-year-old, M)</i>
	Teens need more assurances of data privacy and security	B, C	<i>“The one concern that teens may have is whether their data will be shared publicly. Some of the data,..., is confidential and very personal.” – P1 (16-year-old, M)</i>
Teens sought authoritative roles in research for meaningful contributions	Teens prefer deeper conversations about shared experiences with peers	B, C	<i>“If I could add one thing it would be to give more time for teens to talk amongst themselves about certain topics relating to the study.” – P3 (15-year-old, M)</i>
	Teens want to understand the underlying working of the design solutions	A, B	<i>“I wanted to see an example of how the system specifically works. Sometimes words won’t be enough for certain people, and an example of a situation where the system could be involved would have been nice to examine.” – P7 (16-year-old, F)</i>
Teens’ feedback varied based on the research stage and their level of involvement	Teens were more skeptical when provided with limited study details	A	<i>“Does the detection system always change to adapt to new circumstances? I’m wondering if a red flag might not be noticed when the scan is run.”– P6 (15-year-old, F)</i>
	Teens criticized the quality of interviews and engagement given elaborated study designs	B, C	<i>“Scenarios were repetitive they’re going back to the questions and looking at it, the text messages and all that was repetitive”– P3 (15-year-old, M)</i>

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