



"Everyone is Covered": Exploring the Role of Online Interactions in Facilitating Connection and Social Support in Black Churches

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ABSTRACT

Faith institutions provide social support and community care for many in the United States (U.S.). Notably, churches with predominantly Black populations have served as a site for social change and care provision, historically and in contemporary society. However, the pandemic has emphasised how localising these care networks in physical spaces can limit access to social support. Information and communication technologies offer opportunities for expanding access to care in these communities. However, integrating care networks into online contexts remains a challenge for many churches, and the potential for technology to expand these networks is not well understood. Through interviews and focus groups with nine church members, we explore how hybrid faith communities that bridge offline and online contexts can enable social support and care provision. Our findings highlight care network structures in Black churches, barriers to embedding these networks online and strategies for building more seamless hybrid support systems.

CCS CONCEPTS

• **Human-centered computing** → **Empirical studies in HCI**; **Empirical studies in collaborative and social computing**; • **Social and professional topics** → *Religious orientation*.

KEYWORDS

techno-spirituality, online communities, faith-based technology

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1 INTRODUCTION

The community is a crucial unit of social organisation, especially for marginalised groups. Being excluded from mainstream public services (due to discrimination based on race, gender, sexuality, ability, among other factors) forces marginalised people to develop their own systems of support to address their own unique needs [48]. Consequently, it is unsurprising that community relationships are directly linked to improved health and wellbeing outcomes for marginalised groups [24, 61]. The advent of social media has drastically transformed the organisation and maintenance of community ties. People now rely on online interactions to reinforce real world connections and expand their social networks. The popularity of online communities as a site of connection, mutual support and resource sharing has made them an entity of interest for HCI researchers [8, 32, 64]. Past HCI research has shown the mutually beneficial relationship that can arise between offline and online interactions, whereby online interactions can strengthen offline relationships for community members [25, 29] and vice versa [49, 68]. Thus, online communities present opportunities for expanding the benefits of real-world communities for marginalised populations.

In the United States, churches with predominantly Black populations (Black churches) have been a vital site of social change and community support. A 2020 survey of Black Americans found that among those respondents who attend religious services, 60% reported attending a Black church [51]. Given the history of marginalisation of Black people, Black churches play a pivotal role in maintaining the wellbeing of their members. Beyond meeting the spiritual needs of members, Black churches provide resources that tangibly support the wellbeing of members by satisfying financial, educational, physical, and social needs [26]. Much of this work happens via robust social networks embedded in the church through which care is exchanged between members—*care networks*. These care networks catalyse collective action among members, facilitate community development initiatives, educate members, and are a key source of social support [73]. For low-resource communities, the financial, educational, social and health resources these networks provide are essential to coping with socio-economic barriers to wellbeing. While the Black church and its community support efforts have historically been localised in the physical church building, the success of online communities in extending the wellbeing benefits of traditional communities reveals an opportunity to amplify

the impact of this organisation for its members. This opportunity is especially important in the wake of the COVID-19 pandemic, which has reduced access to in-person interactions for Black churches. Members of these churches have had a slower return to in-person church services in spite of being significantly more observant than their catholic and evangelical counterparts [15]. Further, as compared with other Christian faith communities, members of these churches are most likely to report their congregation remaining closed amidst the pandemic [15]. Given the importance of in-person interactions to the exchange of support in Black churches, these trends describe how the pandemic has reduced access of community members to a critical social support resource.

During the pandemic, churches expanded their online presence utilising Facebook pages, live streaming sermons, and even cultivating online communities on platforms such as GroupMe (a group messaging mobile app), Facebook groups and WhatsApp [10]. In spite of this trend towards online modes of interaction for churches, little is known about how online faith communities can be designed, organised, and maintained in a manner that meets the values and expectations of community members. Even less is known about how such online environments may be tailored to the context of Black churches in a way that integrates the unique cultural identities and values of these organisations. Understanding this problem space is central to increasing members' online engagement with their churches, and allowing predominantly Black churches to increase their reach and accessibility to valuable social, educational and wellbeing resources for members.

In this paper, we report on a nine-week community-engaged research effort with nine members of two predominantly Black churches in the northeastern United States. In this study, we examined how online interactions can scaffold social support systems in predominantly Black churches. We deployed an online community prototype in the two churches and we present findings from interviews and focus groups with community members. Our findings address the following research questions:

- **RQ1:** What are the characteristics of care networks in predominantly Black churches and how do they shape collective efficacy and sense of community?
- **RQ2:** What key values do church members seek in online communities?

Our findings indicate that for the churches we studied, online interactions have become central to their efforts in securing the wellbeing of their members, especially given the restrictions that the COVID-19 pandemic has placed on community members. Members described strategies by church leadership that maintain one-to-one, one-to-many and distributed networks of care. Although members conveyed a strong sense of community, many of them report a reluctance to draw on these substantial networks of care in times of need. We also found that integrating an online community within these care structures was not straightforward—members highlighted the need for collaboratively negotiating online community roles, and a need for a reframing of the role of technology in their churches.

These findings contribute to the larger literature in technology-spirituality [56, 57, 62, 77, 78] and online community-building [31, 36, 60, 65, 75] by 1) highlighting the nature of care networks in predominantly Black churches, 2) providing a case-study for how

HCI researchers may collaborate with real-world groups to design tailored online extensions of their communities, 3) highlighting key barriers that such communities may encounter in integrating in-person networks with online ones, 4) strategies for overcoming such barriers, and 5) expanding frameworks of the design and evaluation of online communities to capture the context of hybrid communities (i.e., those that span offline and online contexts). Critically, we offer key design considerations and opportunities for further research in developing hybrid communities based on pre-existing care networks that amplify the reach, accessibility and impact of such networks.

The COVID-19 pandemic has transformed community interactions and collaboration across all contexts, from work, school to entertainment [21, 44, 55]. Hybrid modes of interaction are rapidly gaining traction [11], and it is important to examine what such interaction modalities look like for institutions that have historically relied heavily on in-person interactions to facilitate social support and capital for marginalised communities, such as the Black church. To overlook the context of the Black church in this transformative period is to run the risk of impairing the capacity of these institutions to act as a source of and wellbeing-affirming resources for Black people who are already disproportionately impacted by the COVID-19 pandemic [27].

2 RELATED WORK

While online communities have remained a widely explored area of HCI research, little is known about how faith and spirituality may be embedded in such communities to facilitate community engagement and extend real-world care networks. We examine the role of faith in shaping the needs of online communities, the nature of care networks in faith communities, and barriers and strategies to integrating in-person care networks of faith communities with online interactions in the Black church. In the following sections, we outline existing work on the importance of online communities, their role in strengthening in-person communities, and faith-based technologies.

2.1 Reinforcing In-person Communities with Online Interactions

Online communities support information exchange, emotional support, and social connection between people, all of which generate positive wellbeing outcomes for members [17, 18, 45, 47]. Welbourne et al. find that simply observing the exchange of social support in online communities can improve one's sense of online community and improve health outcomes and symptoms of women dealing with fertility issues [75]. The act of sharing online is also associated with positive wellbeing outcomes for members of online communities. Members find value in connecting with people that they share experiences with online and peer support online alleviates anxiety and stress for members [2]. Further, online interactions can enhance in-person relationships and hybrid interactions are positively correlated to higher relationship satisfaction [20], stronger bonds and increased trust [50].

Significant work has explored the design of online communities. Preece argues that successful online communities design for both ease of use, and supporting social interaction (sociability) [60]. She

describes three components to good sociability—purpose, people and policies. Other work considers different metrics of community success—online communities must satisfy users’ desire to acquire knowledge, experience pleasure or other emotive needs, appear as credible and confident, feel part of a group and seek distractions from problems [66]. Irriberry and Leroy also cite purpose, code of conduct, focus, among others as success factors in the inception phase [37]. However, to our knowledge, no prior literature outlines a needs or success framework for the design of hybrid communities. Our work extends these frameworks, with a special focus on design considerations that are necessary for the success of hybrid communities.

Current research indicates that online communities make important contributions to their members’ wellbeing at an interpersonal level, and some work even explores how these benefits may be realised at the community level for pre-existing in-person communities. Early explorations of this in HCI tend to centre the neighbourhood as a unit of concern. One notable example is the Blacksburg electronic village, where researchers built a community network for a neighbourhood using participatory design. They also observe the emergence of sub-communities which account for the majority of community interactions and serve specific needs of their members, allowing for multiple views of the community to co-exist and bolstering diversity in the community [12]. Further, Hampton and Wellman find that internet access, combined with an online discussion platform, improved the relationships between neighbours in a Canadian suburb. In particular, they observed increased communication and contact with weaker ties in this suburb [30].

Community informatics has also explored the role of technology in mobilising community members, increasing the flow of information and social capital. Online civic engagement platforms allow local communities to coordinate problem-solving and mobilise members for collective action [38]. In a study exploring how mobile interventions can connect low-income neighbourhood residents to local resources, Irannejad Bisafar et al. find that online and offline interactions of participants generates increased involvement, access to resources, and formation of new community ties, allowing them to build family capital [36]. Outside of community informatics, Harburg et al. find that connecting learners to an external online network of support improved their connection to the community, made them more likely to seek help and improved their perceived value of their work [31]. Additionally, Wellman et al. find in an analysis of the social capital of visitors to the National Geographic website that while online interactions do not impact the frequency of other interactions, they serve as a supplementary interaction that extends the level of contact (and network capital) between individuals and their connections [76].

This work demonstrates that online communities are not only beneficial for their members’ individual wellbeing—they can also support resource distribution, increase community connection and participation and increase social support at the community level. However, much of this prior work has centred the neighbourhood as a point of concern, which is especially unique from other place-based communities in that members of a neighbourhood live together in close proximity and spend extended periods of time in the communities under investigation. Less is known about how to effectively design online interactions for place-based communities

that act as a gathering point for members that otherwise may exist in disparate spaces, which may lack these unifying affordances. Further, existing work in community informatics focuses on building stronger ties between weakly-tied people that live in a specific geographic locale; however, it does not indicate the social benefits that members of strongly-tied in-person communities, who are already close, may gain from online interactions.

2.2 The Role of the Black Church

Outside of digital faith-based wellness tools, techno-spiritual scholarship has explored how technology can help religious users enrich their faith without disrupting their core beliefs and practices [6]. Techno-spiritual tools (technology used to support spiritual practices) have been created to support Islamic pilgrimages [46], Zen Buddhist group meditation practices [70], and praying the Catholic Rosary using tangible wearables [52]. Further, in a series of focus groups with patients, caregivers, spiritual leaders, health workers and employees, Smith et al. found that spiritual support in online health communities is not a separate social support category, but is instead a dimension of social support that can be expressed through the different categories of social support e.g. prayer support [69]. An ambient visualisation tool called SoulGarden was developed to allow chronically ill users see their personal online prayer network of real-world supporters while hospitalised [42]. This tool helped reduce participant stress and loneliness by increasing a sense of social presence through visualisations of prayer support [42]. These works demonstrate the powerful ways that techno-spiritual tools can not only support individual spiritual practice but are integral in the provision of social support within online communities.

Outside HCI, some work considers how the in-person church relates to online churches. Hutchings describes online churches as reproducing church norms, while leveraging the affordances of a digital platform [34]. He finds that religious explorations online transcend single church communities, and that Christians online participate in a wider network of resources beyond their physical churches [34]. Outside academia, both the Catholic Church and Facebook have made forays into the online faith community space. In 2021, Meta announced forging relationships with a wide range of faith communities to create online spaces where congregations can fellowship and practice [22]. The Catholic Church also has its own web-based online prayer network called the Pope’s World Wide Prayer Network where users from around the world can gather in prayer [52]. What neither of these pursuits teach us so far is how such online communities can be integrated into real world churches or how such tools can be designed to complement existing community initiatives and social configurations. Given the aforementioned affordances of the Black church and inherent structures within it, designing tools that honour existing programs while centring current practices, knowledge, goals, and experiences of its members is a worthwhile pursuit. O’Leary et al. explored the potential of techno-spiritual digital health tools in nurturing already existing social relationships and the underlying processes that establish a set of norms, roles, practices, and common goals that characterise churches [56]. While participants of this work characterised some technological features that could be helpful in nurturing their community, participants were not able to test

these features nor did the authors comment on how such features could establish an online community presence that complements an existing real world community. We extend this work, by exploring how and why church members gravitate towards certain features and the processes by which they incorporate these features into their existing social groups.

When designing technology for predominantly Black church communities, understanding the tenets and importance of fellowship and their pre-existing networks of care is critical both from an engagement perspective but also as a means to celebrate and honour the community-level values and goals of these institutions. We propose that such efforts can lead to holistic and identity-affirming technologies that support and nurture a shared community vision of collective wellbeing.

2.3 Faith-based Digital Wellness Interventions

Faith-based digital wellness interventions have shown promise in reducing health disparities and have targeted several health topics (e.g., cardiovascular disease [9], substance use [39], diabetes self-management [53] etc.); however, scholarship that considers the unique context of the Black church as it pertains to embedding faith-based digital wellness interventions in real world churches is limited. Past such work has explored interventions that have leveraged both SMS and web-based or smartphone applications. Largely individually-focused, these digital wellness tools have utilised health promotion principles and strategies such as goal-setting, self-monitoring behaviours, dissemination of health education, feedback on baseline health behaviours, and reminders [9, 53].

While this work has demonstrated some success in addressing certain health behaviours, a small subset of these digital wellness tools were administered within a church. Jordan et al. created, evaluated and delivered a computer-based training for cognitive behavioural therapy focused on substance use treatment [39] in a small group-setting with trained church peer health advisors. Researchers found that administering the intervention within a group setting had benefits including broadening participants' social network and increasing their social support around an otherwise stigmatised health topic [39]. Similarly, Newton et al., created a hybrid diabetes prevention program wherein trained church peer health advisors facilitated ten in-person group sessions focused on teaching behavioural strategies [53]. Neither of these interventions included an online health community space to nurture the provision of social support between participants.

Only one faith-based digital wellness intervention has supported church member interpersonal interactions. Brewer et. al.'s smartphone application FAITH! facilitated the provision of emotional and informational support by providing an unstructured group forum feature for recipe sharing in their largely individually-focused cardiovascular health initiative [9]. However, similar to the previously mentioned interventions, the churches that partnered with Brewer et. al. were utilised as recruit sites only. To our knowledge, no prior work has neither studied how to integrate faith-based digital wellness tools into an existing church community's social configurations (e.g., small groups, ministries etc.) or focused on how

such technologies can be designed to complement these existing subgroups in order to deliver social support.

2.4 The Intersection of Virtual Communities and Techno-spiritual Interventions

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3 METHODS

3.1 Study Overview

Extended collaboration with community members is key to developing culturally appropriate interventions [71]. Repeated interactions help develop rapport and create the space needed to understand communities' nuanced values, strengths, needs, and perspectives. However, prior work has found that formative work to develop digital platforms for marginalised groups is typically conducted as a single session [71]. Recognising this limitation of prior work, we built on our three-year community engagement effort with two Black churches in Boston with the aim of developing a faith-based health technology. For this project, we engaged members of these churches in research activities (focus groups, interviews, check-ins) over nine weeks in a three-stage iterative research effort. Our primary goal was to gather community perspectives regarding how online interactions might amplify care networks in predominantly Black churches. Our work was conducted in three phases. First, we conducted semi-structured one-on-one interviews with community members to understand the structure of care networks that facilitate social support and the challenges in integrating these networks with online interactions. In the second phase of our work, we used our interview findings to design a technology probe [35] in the form of an online faith community prototype. In the third and final phase of our study, participants engaged with this prototype over a four-week period and shared their perspectives on the platform with researchers in focus groups and co-design activities. In these activities, they expounded on how different features supported community-building goals, and how their church values may be embedded in selected prototype features. Figure 1 illustrates our research process.

We took a community-based participatory design approach in this work, engaging community members in all stages of the study: research questions were developed in collaboration with community leaders, we collaborated with liaisons in churches for recruitment, initial prototype features were selected based on past feedback from members [56], and members selected the features most valuable to their community for an in-depth exploration of how they could be adapted to best serve their communities. Our research instruments were also shaped by feedback from members during check-ins throughout the study, and community members led engagement on the prototype platform and developed content for the platform.

Table 1: Participant overview

Item	Value	Count
Gender	Man	4
	Woman	5
Age	45-54	1
	55-64	1
	65-74	3
	75-84	4
Education	Some college (no degree)	3
	Associate's degree	2
	Bachelor's degree	2
	Master's degree	2

3.2 Recruitment

In total, 9 church members participated in our study. These individuals were recruited from two predominantly Black churches in the Northeastern United States. Church A is a Baptist church with a membership of about 350 people, and Church B is a non-denominational protestant ministry with a membership of about 30 people. We recruited church members 18 years and older, who had familiarity with and access to a computer, phone or tablet with video-conferencing capabilities. Participants were compensated \$24 per hr for their time. An important step to conducting community-based research is establishing relationships with gatekeepers to the community, as LeDantec and Fox have described [43], and negotiating with them on how to engage community members with researchers. Thus, in the spirit of collaborating closely with churches and allowing them to drive research, we met with liaisons multiple times before our study to discuss recruitment from their churches. We found that liaisons were understandably wary of introducing church members to new technologies that were not fully developed and that they were not familiar with. Due to this, they were only willing to include a few members in our study to learn more about our technology probe and build confidence in it before exposing more members to it. Consequently, most (7) participants were lay leaders in their churches.

82% of churchgoers who report attending at least once a week are at least 30 years old (52% are older than 50 years old) [13] and 40% of them are women [16]. The median age of churchgoers in the US is 53 [14]. Table 1 describes the characteristics of members who participated in our study.

3.3 Data Collection

In our initial meeting with participants, they provided verbal informed consent over video call with a researcher and were asked to complete a short demographic survey. We engaged in data collection with our participants in phases 1 and 3 of our research process. In phase 1, all 9 recruited members participated in one-on-one interviews. In phase 3, we conducted a focus group with 8 of our recruited participants and a follow up focus group with 7 of our recruited participants.

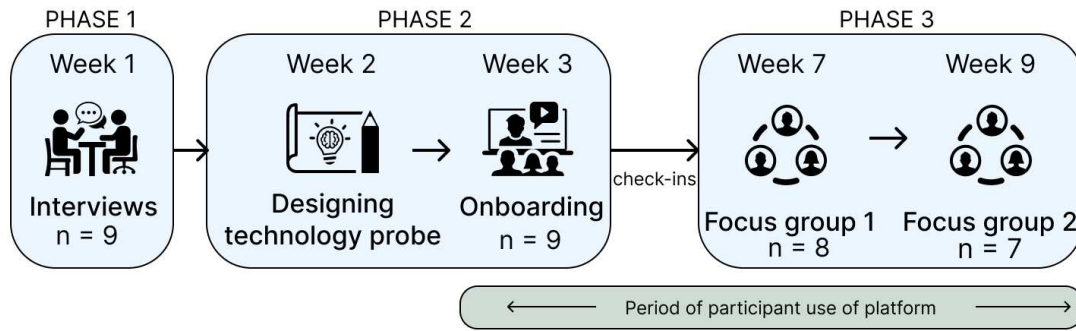


Figure 1: Overview of data collection procedures

3.3.1 Phase 1: Interviews. To explore RQ1, we conducted semi-structured one-on-one interviews with all 9 church members. Each interview lasted 1.5 to 2 hours and explored participants' sense of connection and sense of collective efficacy in their churches. During the interview, we asked about participants' perceived sense of collective efficacy using the collective efficacy of personal networks questionnaire [3], which asks participants to rate their agreement (on a five-point scale of strongly disagree to strongly agree) with twelve statements about their church community's capacity to mobilise efforts towards a shared goal or to support members. We also asked participants to describe experiences that demonstrated evidence for their chosen rating. The questionnaire was designed to elicit participants' perceptions of both network responsiveness (the network efficacy available in their church) and collective efficacy (the ability to ask support from other church members) [3]. We also asked about members' sense of connection to their church community using the sense of community index [59]. Members were asked how much they agreed with twelve statements about their relationship with their church. They explained their responses by providing anecdotes. These questions were supplemented with researcher-generated questions around the value of connecting with church members, ways of connecting with members, and how the pandemic transformed members' interaction with their churches.

3.3.2 Phase 2: Church Connect Community Design & Development. We used insights from our interviews and past work characterising community dynamics within predominantly Black churches [56] to develop an online community prototype called Church Connect Community. Using the Wix platform, we designed the prototype to be an open-ended and flexible tool that church members could mould to the contextual needs of their churches. In creating this technology probe /citeprobe (as opposed to a finalised system), our goals were to help study participants 1) trial a concrete instance of a system that supports community engagement amongst church members, and 2) use these experiences to communicate key factors essential to the design of online platforms that enable care, support, and engagement within their communities.

- **Fellowship Partners.** While churches in general have well-developed social infrastructure to support community engagement, limited in-person interactions make it difficult for members to meet new people [56]. We designed a strategic

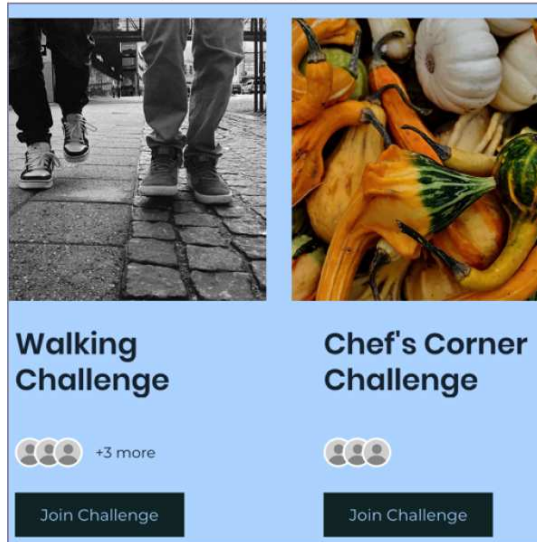
matching system that pairs users who opt in, with another user based on interests and hobbies, gender and church association preferences, and their goals for the partnership (Fig. 2).

- **Community Challenges.** In formative work with these churches and our interviews, we find wellbeing to be an important concern of the churches, which they uphold through ministries that are focused on improving health and wellness of members. Consequently, we explored how to support online interactions through a challenge feature that supports spiritual, mental and physical health initiatives. We designed four basic challenges around wellbeing activities members were already involved in: walking, scripture reading, cooking, and meditation, and encouraged members to suggest new challenges that they felt would be valuable to their church (Fig. 2). Challenges centred community connection, a key value for church members, by connecting challenge participants through groups and supporting weekly check-ins.
- **Community Conversations.** Prior work indicates that participants seek to fellowship with a wider church body to further their spirituality [56]. We supported community engagement across churches by designing an open forum to which all members across churches can contribute (Fig. 3). The aim of this feature was to create a space where members across churches can interact with each other, share resources and support one another.
- **Fellowship Groups.** Our interviews revealed the importance of sub-groups and ministries in the churches we worked with. We created opportunities for self-constructed groups for members to emulate pre-existing ministries and support more intimate connections between members, and to allow for the creation of sub-communities of interest within and between churches (Fig. 3).

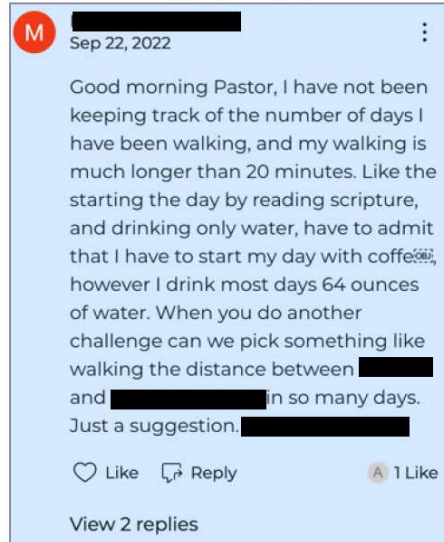
3.3.3 Phase 3: Focus Groups. We introduced the Church Connect Community to study participants in an onboarding session where we reviewed each feature. In this session, participants were asked to use the platform at least twice a week for seven weeks. During this seven-week deployment period, we conducted a total of two 1.5 to 2 hour focus groups per church to answer RQ2. Due to outstanding events in participants' lives such as illness and family issues, some participants could not participate in focus groups. The first set of

A. Community Challenges

A1. Challenges signup interface



A2. Challenge group post



B. Fellowship Partner

Fill this form to get matched

Looking for a person in the church connect community to connect with? Answer a few questions about your goals and interests and we will get back to you soon when we find a match! You can connect with people over specific concerns, interests, for advice, or even just to meet new people.

Full Name Phone (Will not be shared with your match)

Select your church *

Gender *

I want to match with someone: *

- ☐ In my church
- ☐ Outside my church
- ☐ No preference

I want to match with someone who is *

- ☐ Same gender as me
- ☐ Opposite gender as me
- ☐ Any gender

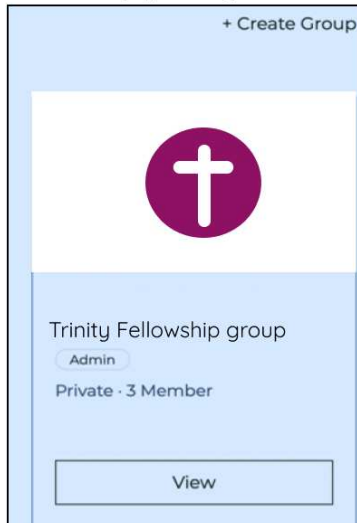
Indicate any activities you enjoy or are interested in

- ☐ Biking/running
- ☐ Cooking

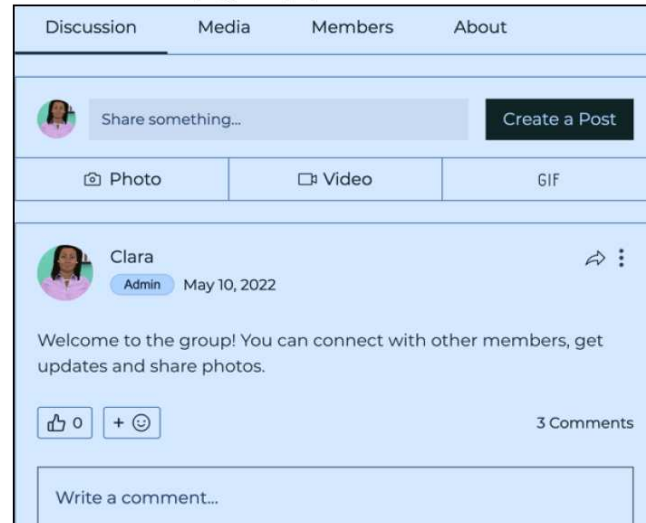
Figure 2: Church Connect Community: Community Challenges and Fellowship Partner Form. At the top, the Community Challenges section of the prototype is shown (A). Participants were provided an overview of the community challenges (A1), including which members have already joined; they were then able to join challenges of interest. An example post is shown from the walking challenge (A2), where a participant makes a suggestion for improving the challenge. Lastly, the bottom image shows the fellowship partner form (B), which enables participants to be connected with another church member.

A. Fellowship Groups

A1. Group joining interface



A2. Fellowship group post



B. Community Conversations

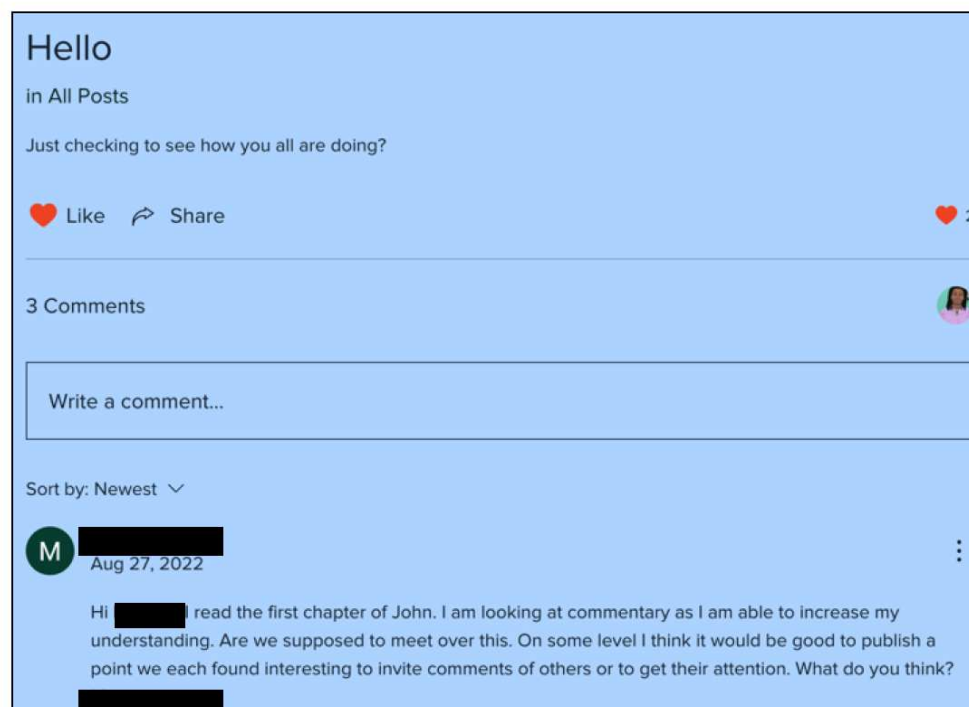


Figure 3: Church Connect Community: Community Conversations and Fellowship Groups. At the top, the fellowship groups interface is shown (A). Participants could join fellowship groups (A1, group name is a pseudonym). They could also make posts, send likes, replies and share media (A2). The bottom image shows an example interaction in a community forum, with a post, likes and replies (B).

focus groups occurred after four weeks of use with 8 of the 9 recruited participants, to gain an initial understanding of participants' reactions to and engagement with the platform. In this focus group, each church group selected one feature to focus on for the rest of the study for further exploration. Participants discussed how they could practically implement their chosen feature in their church, and developed a plan for group engagement for the remainder of the study.

At the end of the seven-week deployment period, we conducted a second set of focus groups with 7 of the 9 recruited participants. We engaged participants in a design exploration to understand what church values were key to the success of an online community for their churches, and how these values could be embedded in the Church Connect Community feature they had chosen to focus on. Participants engaged in a matching exercise to identify what online community functionalities would be necessary in their chosen feature to engender the values they shared. Participants were also presented with two exploratory scenarios with the aim of provoking discussion about how their chosen feature could create opportunities for connection, care and social support in their communities, and to establish the boundaries of participants' expectations for these features. Figure 4 illustrates an example of these scenarios.

3.3.4 Analysis. As a first step in our analysis, we analysed our interview notes using affinity mapping [7] to identify an initial set of emergent themes. Next, we inductively coded [19] the interview and focus group data using NVivo qualitative data analysis software to generate low-level codes labelling concepts in this data. These codes were then iteratively clustered into higher level categories, representing key themes in participants' responses. Demographic survey data, collective efficacy ratings and sense of community ratings were analysed using basic statistical analysis in R studio. We converted scores to percentages to compare subscales for collective efficacy.

3.4 Positionality Statement

Dombrowski et. al emphasise the importance of reflexivity in designing for marginalised populations to identify how researchers' experiences and values shape design outcomes [23]. The first author who led research efforts and analysed qualitative data identifies as a Black christian woman and grew up attending protestant and non-denominational churches. The second author identifies as a white woman, was raised in a Catholic school, and is a member of a Unitarian Universalist Church. Other authors grew up in Protestant churches, and one author identifies as Jewish. Due to the restrictions of the pandemic, the first author has not had in-person experiences with the target communities; however, the second author has been engaged with the communities for four years. The first authors' Christian background allows for a common language with community members; however, we acknowledge that aspects of the culture of predominantly Black churches may still be unfamiliar to authors, and this may shape interpretations of qualitative data. Further, lack of in-person familiarity with the community may limit participants' comfort in sharing fully about their experiences. We share these identities and experiences to contextualise the work we carried out with these communities, and to acknowledge that

despite our community-driven approach, findings are still shaped by our individual backgrounds.

4 FINDINGS

Our multi-stage, iterative data collection process with community members suggests that church members experience a strong sense of community, and that the closeness they experience with other members shapes how they communicate their needs and access care in church communities. We identify three care network structures through which church members are able to give and receive support: 1) one-to-one, 2) many-to-one, and 3) one-to-many structures. We describe the different purposes these structures serve for the community. Participants shared their challenges in integrating these structures with online interactions in the aftermath of the COVID-19 pandemic, and discussed strategies their churches have implemented to address these challenges. They also assert the importance of role assignment in facilitating integration of online communities with in-person ones.

Reflecting on their experiences with an online faith community prototype, participants outlined the need for such communities to align with their church values in design, highlighting inclusivity, supportiveness, informativeness, and interactiveness as key values to consider for their communities. Probing into their chosen feature from the prototype, they expound on design directions that would enhance these features to better serve their churches. Principally, these findings illuminate the socio-cultural complexities of predominantly Black churches and provide a starting point to understanding how the unique affordances of this institution may be embedded in online platforms.

4.1 Building Closeness in the Church

Across both churches, participants display a strong sense of community. The findings in this subsection describe how participants build close relationships in the church.

Most (8) participants expressed a high sense of connection to their church community. Participants scored an average of 84% (s.d. = 16.4%) on the sense of community index, indicating a strong sense of community. Across both churches, many church members explained that what drew them to their churches in the first place was the sense of camaraderie and friendliness of members on their first visit. They expressed feeling welcomed and at home at their churches, even before they had established deep relationships in the church. Church members cited serving their community and God as one way of building connections in the church. Ministry work allows members to see and interact with other members continuously, allowing them to build relationships within the church. One participant described:

"It begins working in ministry and volunteering. Then when you find out what people like... you sort of gravitate towards certain people... sooner or later, you find out who's connected to who"- P3

These reflections highlight the role of the church in providing relational opportunities, such as events and collaborative activities that engender closeness between members.

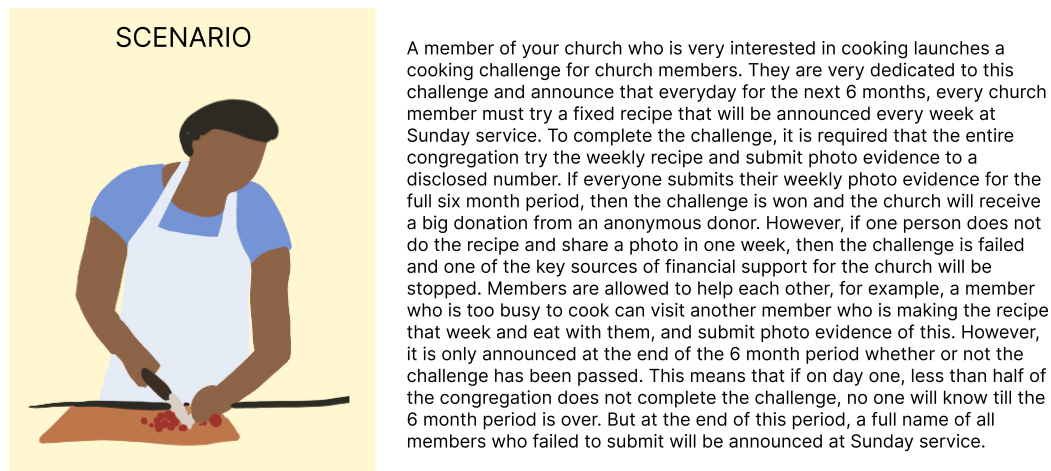


Figure 4: Example exploratory scenario where members were asked for their thoughts on a challenge where they must engage in a cooking challenge for a donation reward. Participants were unmotivated by monetary rewards and found requiring people to cook to violate the value of inclusiveness.

4.2 RQ1: Communicating Care in the Church

We consider the importance of this closeness between members in facilitating the exchange of social support. On average participants scored lower on the subscale of access to collective efficacy (64%, s.d. = 13.9%), which measures the individuals' ability to seek out help from the community network, than on network responsiveness (76%, s.d. = 21.5%), which measures their perception of their network's ability and willingness to provide support. Although these scores cannot be interpreted to mean high or low collective efficacy, the difference between participants' scores on these subscales suggests that while members are confident in the capacity of their church to provide support, they are hesitant to reach out to this network when they need help. Many members (7) expressed that they would not explicitly reach out for support if needed. They explained that "...if I'm emotional, I'm not gonna contact anybody, you know" –P1 and "I like to do everything myself" –P4. While these metrics are not generalisable due to the sample size, they suggest that just because support networks are available, does not mean that church members will tap into them when needed. This indicates that to fully address the needs of all members, it will be important to identify when they may need support even when they may not vocalise it.

We have discussed how the physical church mobilises members to interact with each other and the wider community, promoting the formation and strengthening of relationships between members. These close relationships allow members to identify when others need help even when they do not vocalise it because closeness between members allows them to catch on to cues in other members' behaviours that indicates that they might be in need of support. As one participant explained,

"Our church is close knit ... and when you have those connections, you can tell if someone is a little out of character, lots of times, even if it may not be something overly dramatic." –P8

This comment highlights complexities in the way church members navigate expressing needs and maintaining privacy. For members who "*don't necessarily want everybody to know they have a situation*" –P3, physical interactions provide opportunities for non-verbal communication of the need for support. Indeed, church members affirmed that the main barrier for accessing support for some is the unwillingness to request support. One participant explained,

"they may not...feel comfortable coming up for help. I think some people have been hurt and something we refer to as church for a lot of times, people have been hurt in a church that they grew up in" –P2

This quote conveys how different relationships and past histories with the institution of the church can shape members' willingness to place trust in the larger church community, and the importance of alternate cues to ensuring that all members receive support.

The transition to online interactions diminishes the opportunity for alternate ways to signal the desire or need for support that rely on in-person cues. As such, there is a need to explore how online interactions may be expanded to create similar opportunities for tacit indications of need. Such work is necessary to ensure that members that may shy from explicitly disclosing their needs are still able to communicate through alternate interactions, and be connected to necessary care.

4.3 RQ1: Networks of Care in the Church

Close relationships between members support the functioning of care networks through which church members receive social support. Participants described three structures of such care networks: one-to-one networks, many-to-one networks and one-to-many networks. To understand the ways technology may extend these care networks, we must first understand how care is communicated through these different care networks.

Participants cite their churches as a significant source of support. They emphasised the capacity of their church to support members,

in financial, spiritual, and material ways. On identifying that a member needs any support, *"people just step in and provide help"* –P5. In these churches, there is a community investment in preserving each member's wellbeing. The capacity of these churches to support their members so comprehensively is not by chance. Church leaders and members have developed intentional networks of care within their community that facilitate the exchange of care at interpersonal and community levels.

One-to-one networks. One way care is distributed in the church is through one-to-one networks. In one-to-one networks, members leverage the interpersonal relationships they have built in their churches to receive emotional, spiritual and other material forms of support (e.g, getting a ride to church, food deliveries). One participant mused,

"You know, sometimes you don't need too much, just so sometimes you just need somebody to listen. So I feel like I can... call members and then just vent sometimes" –P2

This participant's comment suggests that not all needs of members require community mobilisation; sometimes, an interpersonal connection is enough. Additionally, for members who strongly desire to establish boundaries around sharing certain details about their lives, those who *"don't necessarily want everybody to know they have a situation"* –P3, and are selective about disclosing their need for support, these intimate networks are crucial to ensuring they receive support.

Many-to-one networks. In many-to-one community support exchanges, church leaders draw on the larger congregation to provide support to a single member, regardless of the relationships they may have in the church. A church member described that in some cases, when a member's need is shared, multiple members of the congregation contribute towards whatever needs they may have, regardless of their relationships with this member:

"...you know, John just lost his job and you know, ... they need some initial help. ... People go in their pockets in a meeting and you'll be sitting there and there'll be several hundred dollars in cash there." –P8

This illustrates an example of how a hypothetical member, who the church member explained can be any member of the church, regardless of who they know, can receive support through a many-to-one network. This example describes how new members, or others who may not be as integrated within the church (and consequently may not have strong bonds to facilitate one-on-one support) may leverage many-to-one networks to receive support. These many-to-one networks catalyse church members towards collective action with the goal of promoting the wellbeing of a single member.

One-to-many networks. On the other hand, one-to-many exchanges of care centralise the distribution of care in a single member, usually a leader figure. As many of the members who participated in this study are lay leaders in their churches, they offered their unique perspectives:

"Individually, you're not reaching out to the entire church, but ... the entire church is covered only because of the way that the church is set up" –P5

Members of Church A explained that in ministries such as the nurturing ministry (which the above quote refers to), smaller sub-communities are created in the church. These sub-communities are under the leadership of an appointed member, who is tasked with checking on and connecting all other members under their care to any support they might need. While some of these groups may be generic, others are tailored for specific needs of some church members. For example, the churches in this study had developed support groups targeted at food insecurity and substance use, providing members who need such support with resources that support their wellbeing. Also, these need-specific groups create opportunities for members with specific concerns or vulnerabilities to connect with a network of similar individuals and promote further connection between church members. Churches secure the wellbeing of their members by maintaining a diverse system of structures through which members may receive support.

4.4 RQ1: Adapting Care Networks in the COVID-19 Pandemic

Nobles describes the Black church as centred on an African view of spirituality that centres a communal approach to religious expression [54]. From this perspective, in predominantly Black churches, religious practices are not only for the individuals' wellbeing, but centre the development of the community at large. Through our analysis, we observed this focus on community manifest through a rich and diverse set of subnetworks designed by the churches in our study. These subnetworks were created to support members with different needs in different contexts. However, we found that one commonality across these networks is their centralisation in the church building, which acts as a convergence point at which different forms of social support are disseminated to members. While acts of care themselves may occur outside the church building, the events that put the exchange of care in motion—for example, identifying that a member needs support, or building one-on-one connections—are localised in the church space. Even before the COVID-19 pandemic, churches have recognised the potential of technology to expand their reach and impact [33]. The church members we interviewed also recognised the role of technology in overcoming the limitations of place-bound networks of care. In the wake of the COVID-19 pandemic, participants' churches adopted technology to salvage impaired care networks and the loss of closeness for members and opportunities to fellowship due to the inability to meet in person. Participants described watching sermons on platforms like Facebook live and carrying out Bible study on Zoom. Some work explores how technology can support access to church resources for home-bound members [1, 41]. Church members echoed this idea, and explained that the increased role of technology allowed for easier access to church practices e.g sermons, Bible study, for members who are sick or too old to commute to church, and even for those who may have other commitments that make commuting to church impossible. Members acknowledged that the *"internet is a great tool, to connect on a larger scale."* –P2. Given that members express inclusiveness as an important value in their churches, this reveals an important affordance of technology to extend church values.

Nonetheless, the loss of in-person interactions has diminished the church experience for participants. Members expressed that a lack of in-person interactions has impacted their ability to connect deeply with each other, sharing that *"not being able to see people and people were...they were just sad because they couldn't come to church"* –P5. One participant expounded on this challenge, saying that,

"You don't know that in these times where our meetings are brief, uh, our conversation can, you know, it's not necessarily protracted. So we, you know, we say what we need to say, and we move on to the next thing" –P1

These participants demonstrate dissatisfaction with their online interactions as a way to connect—these interactions are more targeted and to-the-point, which while convenient for members, also leads to a loss of extended casual conversations and banter, which members cited as an important component of feeling at home at church and identifying the social support needs of other members. Participating in a church, even on Sundays, is more than simply listening to a sermon. The church provides a space for constant interaction and face time, which is integral to forming connections for members. In adapting their practices to online formats, churches sacrifice these rich interactions and support systems for the health and safety of their members during the COVID-19 pandemic.

While most members acknowledged online interactions as important for the growth of their churches, members found it difficult to integrate online interactions with their in-person activities. One key barrier they shared is that attitudes towards technology use in the church have been shaped by the way it was introduced to the church. One participant remarked:

"It was great that we were able to connect and, and be able to, to have worship service and to connect with each other. But at the same time, ... it feels like something that was forced upon us" –P8

Members described that they felt forced into online interactions due to the COVID-19 pandemic, which while convenient, also associated online interactions with the negative sentiments of losing in-person interactions. Participants felt a deep loss of in-person aspects of church culture, but insisted that not every practice is replicable online—for example, they were resistant to simulating shared Sunday meals (a church tradition) online because they maintained that technology cannot capture the deeper fellowship over food and camaraderie shared during these moments. These views towards the increased presence of technology in faith practices indicates the need to reframe the role of technology in faith practices. Beyond weakly replicating traditional in-person interactions, efforts should be directed to developing novel forms of expressing faith and fellowship online. Members agreed with this, asserting that online interactions should feel natural and flexibly accommodate the different technological comforts of members.

4.5 RQ2: Extending Faith Interactions Online—Redesigning Church Connect Community

As described in the Method section, we created and asked participants to use the Church Connect Community prototype to help them explore more concretely how online communities can be designed to amplify access to and impact of care and support within their churches. The features we implemented in the prototype were informed by our interviews with members, and prior work that indicated that participants believed these features would support their community needs of community care, fellowship, social intimacy and privacy [56]. Consequently, we expected that deploying these features would generate high community engagement from members. However, we found that in spite of participants' acknowledgement of the value of these features for their community, they had difficulty maintaining consistent interactions on the platform.

Based on discussions in our check-ins with participants, we centred our first focus group on the difficulties participants had interacting online and brainstormed ways to solve these problems. Participants revealed a need for structured inclusion of the platform into their traditional church activities. Further, we asked members to select one feature to focus on in their future use of the platform. Participants from Church A were most interested in the challenges feature and members of Church B were most interested in the fellowship partner feature.

In their efforts to integrate the prototype into their church practices, participants asserted the importance of delegating roles in order to facilitate accountability in online interactions and engagement. One participant suggested,

"... you know, you need somebody who is that anchor, who's gonna bring you along. Who's gonna send you a message... Who's gonna check in with you" –P1

This quote describes participants' desire for a leader figure that mobilises their group into online interactions. Such a figure would serve as a way to maintain consistent interactions on the platform by initiating interactions online and keeping other members accountable. These comments suggest that leadership involvement in the integration of online and offline interactions for these churches is critical for the success of these online communities. Further, for members of Church A, it was particularly important to have specific members leading the different challenges. They shared that assigning roles among themselves would allow them to explore the different features more deeply. One participant shared:

"...is there someone who may want to ... take on a responsibility for engaging us in these... I think that that would be the best way to get me to respond... It would connect us, I think, as a group" –P1

These comments suggest that creating structure by integrating online roles with offline church roles is necessary to mobilise members into engaging with each other online. Participants described two rudimentary roles—leaders, who steer interaction on the platform and followers, who respond to prompts from leaders. The challenges participants faced in adapting our platform speak to a larger complication in the design of hybrid communities—integrating pre-existing real world roles with online ones. We noticed that while

participants themselves are involved in various leadership roles, they chose to use interest as a determining factor of how roles get assigned online, instead of aligning their pre-existing roles with online roles. This indicates that while roles are critical for true hybrid engagement, negotiating online roles is itself a separate process from negotiating offline ones, and that community members have to be engaged in this role-making/assigning exercise before and during their adoption of an online platform.

4.6 RQ2: Design Explorations in Online Faith Communities

Our conversations from this first focus group led to participants exclusively engaging with the challenges and fellowship partner features for the remainder of the study. In our second focus group, drawing on participants' experiences with their chosen features, and the platform in general, we explored in depth what church values they wanted to promote in an online faith community and how their chosen features may be designed to engender these values for their churches.

For our participants, the church is a site for gathering, communion and fellowship for members. This affordance of the church is one that they expect to be extended in online faith communities. To achieve this, participants highlighted five values that are necessary in an online environment—inclusivity, interaction, supportiveness, inspirational and informativeness. Additionally, participants wanted to create a community that was safe for all members, supported meaningful interactions, and directed members in need to the appropriate resources. Members were also interested in furthering spiritual initiatives such as prayer and Bible study through online communities. We do not present these findings as an exhaustive list of participant desires and needs, but to illustrate how existing technologies may be adapted to engender these values.

Earlier, we mentioned that an important reason participants are able to feel at home in their churches is due to the friendliness of members, and the general sense of welcoming they felt on first joining their churches (and after). Participants saw technology as having the potential to expand on the affordances of their churches by creating an inclusive, accessible and encouraging environment. Members of Church A described that one way of creating an inclusive environment was group messages, which "allow you to communicate with everyone without anybody being left out" –P6. While members value one-on-one interactions (as expressed earlier), they found it important to create avenues for all members to contribute and be heard. They also expressed that weekly check-ins would allow them to identify the needs of all members, as well as how to support those in need. One participant described,

"...you wanna check in on the members to make sure that they're okay. You know, if there's anything that you can do for them. So... I would think weekly check-in would be important" –P6

This remark provides one way that members envision being able to maintain care for other members through online interactions. Members of Church B also agreed that weekly check-ins would allow them to support other members on a one-on-one level, and even expressed that it may also be helpful at a community-level. One participant said,

"Weekly check-in doesn't have to be just for one particular person. It could be for the whole community... You know, we have a lot of, a lot of families that have lost everything in fires now... weekly check-ins, you know, we, we offer to come pick up, come and choose any free clothing that we have, you know, free blankets..." –P9

This participant explained that the church has mobilised resources to support members in hardship (in this case, victims of fires) and that weekly check-ins may serve as a way to make members aware of the availability of these resources without directly reaching out to individual members. This affordance allows for members who are reluctant to express needs to receive support. Participants also expressed strong dislike for technological designs that they found to be inaccessible to some members or alienate members. In the exploratory scenarios exercise, we observed strong opposition from participants for scenarios that involved features that all members could not participate in. A member of Church A reacted to one scenario about a cooking challenge where church members were required to cook a given recipe every week,

"I think that it is actually,... very inconsiderate because ...we have people who come to church so that they could get a meal, you know? And so for us to put that kind of stipulation on them, I just think it's very thoughtless" –P1

This comment shows how building in some expectations of interaction (in this case, cooking a specific recipe) can exclude some members from the larger church community due to their limited access to resources. This suggests that flexibility to the different capacities of members is important for successfully creating a supportive and inclusive online environment.

Additionally, in our scenarios, we sought to understand what kinds of incentives would encourage engagement online for participants. Participants expressed strong positive sentiment for scenarios that embodied their church values, and engaged in sustained debate over those that conflicted with these values. Across both churches, the single most important motivator for engagement was bonding with other members. Even though all scenarios included a monetary element, participants did not find it to be a meaningful incentive. One participant asked about a challenge that rewarded participants with a church donation,

"...why would we do this? I mean, I don't think that \$50,000 is a big enough why ..., it's not really building fellowship, camaraderie, spirituality, it's, you know, it's not doing anything" –P1

In this statement, we see that participants value the fellowship and spiritual growth contributions of online interactions over material incentives. Ultimately, online interactions must enhance their connection to the church and/or God in order to be attractive to members. Members of Church B go further to describe such material incentives as distractions that are subtractive for their spiritual wellbeing. P9 explained,

"... this conflicts with the love we're supposed to show each other... Because now you're thinking of the

\$10,000. You're not thinking of really sharing something for the love of others, you know?" -P9

This comment revealed that beyond being a place for members to convene and support each other, it is important that no elements of online interaction detract from members' spiritual growth. That technology reinforces users' core beliefs without disrupting them is a major tenet of techno-spiritual tools [6, 58, 69]. Consequently, care must be taken to ensure that online interactions do not give rise to behaviour that contradicts members' spiritual beliefs. Instead of material incentives, members look to building connection as a significant motivation for interaction. P9 continued to describe that *"something that I know that also is an incentive for our members is ... we come together and have a meal together, you know it creates bonding and it creates a time of actually talking to each other besides the normal service"* -P9. We see here that connecting together is already a key incentive for members' participation in church in the real world, and participants value building on these pre-existing motivations.

Our findings in this section highlight rich cultural components of Black Christian practice—prayer, Bible study, check-ins, shared meals—and how they contribute to members' sense of belonging and spirituality in the church. Church members described the different ways these practices and values may be supported or hampered by online interactions. While this is hardly an exhaustive description of the different roles technology may play in supporting churches, these values and practices are directly related to church's capacity for community action and support [4]. Consequently these findings offer a starting point to understanding how technology can amplify this capacity through affordances that increase access to these cultural components that allow members to build their community networks.

5 DISCUSSION

We collaborated with community members to explore the ways that technology may amplify care networks and spiritual practices in predominantly Black churches. HCI has explored factors that shape online community success, role-making online, and the role of online communities in strengthening community ties. We extend this work to the context of the Black church, characterising the nature of support networks in the church and exploring how these networks may be amplified through online faith communities. Critically, we identify how the variety of support structures allows members who are reluctant to reach out for help to still access it. Other work has explored the design of techno-spiritual interventions for wellbeing. We build on this work by providing a case-study of how faith values may be embedded in online interactions to provide new fellowship opportunities to church members. We do not present our findings as a comprehensive characterisation of the cultural context of predominantly Black churches. Indeed, while the Black church is unique in its emphasis on practices and care networks that support its communal approach to spirituality, these practices themselves are not inherently exclusive to predominantly Black churches. However, considering the socio-political role these churches have played in the liberation of Black people historically, and their continued commitment to the preservation of wellbeing of Black people across the US, our findings highlight the role

technology can play in amplifying these community-preservation initiatives of such churches and provide a case-study of how this may be achieved for the wellbeing of members of predominantly Black churches.

5.1 Black Church Culture in Action—Considerations for Techno-spirituality

Our findings describe several components of the culture of predominantly Black churches and reveal some of the ways the pandemic disrupted traditions designed to foster connection in predominantly Black churches. Swidler theorises that during periods of change where new traditions are being made, culture provides a toolkit that allows for the construction of different strategies of action, which may later coalesce into rituals and traditions [72]. We consider the current moment for the Black church as such a period of transformation. Black churches have begun to establish new strategies of action to extend the impact of their place-bound care networks. We note the increasing role of technology in these new strategies of action, allowing church members to imagine new ways of connecting and providing support to each other. Our findings maintain that even in a time of social distancing, the church remains a site of communion and connection for members in spite of its reduced capacity to facilitate connection. Our findings provide a case-study of how the cultural identity of predominantly Black churches may be extended through design considerations, and exhibit the importance of community-driven design in achieving these outcomes. Church members' engagement in online platforms requires more than the presence of features they value. Community collaboration in deciding the goals, areas of application for online interactions, and the establishment of roles with active members of the community was key to participants' engagement online. Gleave et al. describe how online social roles support the cultivation and maintenance of online communities [28], and other HCI work explores emergent roles in gaming [5] and online health communities [79]. We extend this work to the context of faith communities, identifying basic roles of leaders and followers on our platform. We recognise that while established in-person communities may have pre-existing community roles, these roles may not translate to an online context, and new roles may be required to facilitate smooth running of the online community. Future work should investigate what new roles may be required in online faith communities, how these roles interact with in-person roles, and how the needs of church members online are shaped by the roles they play both online and offline.

5.2 Redefining Success in Online Communities: Considerations for Hybrid Communities

Our conversations with church members indicate that community coherence between online and in-person interactions is crucial for user engagement. As we see in our exploratory scenario activities, church members have no interest in participating in platforms that do not embody their church values or that disrupt them. This indicates that for interaction to happen in online platforms, especially those designed for faith communities, it is not enough for the platform to be usable and sociable; the platform must necessarily engender the values of the community. Past work that explores the

embedding of race and faith in socio-technical systems supports these insights, emphasising the importance of flexible adaptation to community goals as a mechanism of engagement and motivation for use [57]. Moreover, the platform must integrate with in-person interactions that form part of pre-existing norms, as is indicated by participants' interest in features that extend their already-existing modes of support over new ones. Our findings indicate that integration with the physical community is key in supporting community ownership of the online system, and determines the success of such platforms for the communities they serve.

We notice that current frameworks for online community success [37, 60, 66] do not consider the relationship between in-person communities and online communities, which our findings indicate is critical for the success of hybrid communities. Given the increasing relevance of hybrid communities, we recommend an expansion of metrics of success for online communities, that consider the ways that online and offline interactions are integrated for such communities. For example, further research can consider members' sense of online community and its relationship to their sense of in-person community. Our findings also highlight the importance of spirituality in the design of online communities for faith communities, another dimension we note to be absent in frameworks that describe the needs of online community members. Further work in techno-spirituality should examine the nature of spirituality as a need of online faith community members, exploring the ways it may diverge from knowledge, emotive, self-esteem, and group-belonging needs or manifest as a dimension to these needs. Such work must also consider how faith values shape the ways that these needs are satisfied for church members.

6 LIMITATIONS

Our study was conducted with a small sample of members from two churches in one region of the United States. This sample size indicates that scores on sense of community and collective efficacy metrics are not generalisable to the wider church population. Our interpretations of these metrics are also limited since we do not have data that describes what scores count as high or low sense of community and collective efficacy, or access to comparative data on general population averages for Black churches or other faith communities as a point of comparison. Our sample size was purposefully small, and driven by our church partners' preferences. Indeed, with our commitment to adhering to community-based participatory research principles [74], our church partners drove most aspects of this research (including recruitment). We had many conversations with multiple leaders in the churches about how to involve their members in study processes. In these meetings, leaders overwhelmingly reported discomfort with including large numbers of their congregation due to the early-stage nature of our work. Our church partners were understandably protective of their members, in that they did not want to introduce them to any new platforms that they did not have complete confidence in. Consequently, inspired by work by Taylor, Romero and Judge [40, 63, 67], we adjusted our study design to allow for more in-depth interaction over time with our small set of participants. While our limited sample size impacts the generalisability of our results, we were able to generate robust themes due to this in-depth engagement

and reach saturation in interview data for key themes presented in this paper. Nonetheless, further work comparing themes found in our work across wider populations of churches would serve to contextualise sense of community and collective efficacy scores, and support the identification of general church affordances that engender high sense of community and collective efficacy in churches. Such work would also help understand the applicability of our qualitative findings in other faith contexts.

Additionally, while engagement and collaboration was enhanced by participants' closeness and status as lay leaders, their reports of closeness and connection may not be representative of the larger church population since some members may be less involved in the church. However, church members did describe their congregations to consist of highly involved members, due to their close-knit relationships with each other.

Additionally, since our participant demographic skewed older in age, further work that considers younger populations' attitudes and perspectives towards technology in spiritual practice and the role they imagine technology playing in expanding their faith communities is necessary to understand how such hybrid communities should be designed. While these limitations do not allow for generalising our findings, our results reveal several important themes in techno-spirituality and the design of online communities..

7 CONCLUSION

The Black church is a unique kind of social group in the ways that it upholds relationship-building, social intimacy, and collective care for the wellbeing of its members. With the increasing relevance of online interactions (especially after the COVID-19 pandemic), this social group finds itself in a period of flux where cultural practices of care are being transformed by technology. In our work, we explore the ways that online interactions may expand the care network affordances of Black churches and the ways that spirituality may be embedded in online communities. Our findings highlight the ways that care is transmitted in Black churches through care networks, describe the challenges in integrating these networks with technology, and provide a case-study of how these barriers may be overcome through community collaboration. While these findings are not strictly unique to churches with predominantly Black populations, these churches have historically played an instrumental role in community development for low-resource Black communities, making their impact in these environments significant. Consequently, supporting the capacities of these institutions to serve their communities especially after the impact of the COVID-19 pandemic is important to sustaining critical wellbeing and social care resources provided by these churches. We provide design considerations for hybrid faith communities to amplify the reach and impact of these care networks. Our work contributes to techno-spiritual research and online community research, and we call attention to the importance of further research exploring the role of spirituality in online community success for faith communities.

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