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Designing Methods Towards Resilience: A Critical Reflection on Co-Designing Technology with Families During Early COVID-19

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In the reactive environment of adjusting to remote learning and life during COVID-19 pandemic in the United States, families had few opportunities to collaborate, play, and imagine better futures. Using family resilience theory as a guiding framework, we describe a study of 30 US-based families who participated in a ten-week study using the Asynchronous Remote Communities (ARC) method between April and July 2020. In this paper, we analyze the affordances of co-design activities for envisioning solutions to family needs during the pandemic and share concerns as well as future directions for designing methods for resilience. Our findings suggest the asynchronous, creative collaboration through playful and open-ended prompts in our study lays the groundwork for cultivating family resilience, and we identify gaps in methods for sustained resiliency. We suggest modifications for applying the ARC method with educational communities and reflect on family engagement for relational commons.

CCS Concepts: • **Human-centered computing** → *Collaborative and social computing*; Empirical studies in collaborative and social computing;

Additional Key Words and Phrases: Families, Children; Co-design; Asynchronous Remote Communities; Pandemic; COVID-19; Remote Learning; Critical Reflection

1 INTRODUCTION

As a result of the shutdowns resulting from the COVID-19 pandemic in 2020-early 2022, design and research methods had to become more virtual and flexible to meet participants' needs. As people nationwide have experienced losses such as death, sickness, job loss, and tolls on mental health [32], researchers have needed to adapt their methods accordingly. Our work builds on family resiliency theories, family co-design best practices, critical HCI, and trauma-informed research.

Specifically, this paper critically reflects on the affordances of a remote, asynchronous community (ARC) method as a design approach for serving the dual roles of co-developing solutions while simultaneously supporting family resilience, especially during unprecedented circumstances like the pandemic. Asynchronous Remote Communities (ARC) are a qualitative research method where participants (usually geographically distributed) engage in individual and collaborative research activities through an online platform [39]. The ARC method can act like an umbrella structure, nesting other methods within it's weekly prompts - such as diary studies, survey, and cooperative inquiry methods [14]. Traditional family resilience theories define the phenomena as the ability to recover from and cope with adverse circumstances [61]. Walsh et al. specifically focus on families' ability to make meaning among challenges, remain adaptive, stay connected, and engage in collaborative problem-solving [61]. As our research team was also living through the pandemic, there were missed opportunities for ad-hoc, critical reflections among the researchers while the study was unfolding. In this paper, we reflect on both the beneficial aspects of the ARC methodology alongside the challenges of trauma-informed research during the early-stages of a crisis like a pandemic.

Specifically, this critical reflection addresses the following research questions:

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(1) How are methods like Asynchronous Remote Communities (ARCs) and digital adaptations of the cooperative inquiry method of "mixing ideas" conducive to building family resilience?
(2) How could researchers conduct co-design activities during a crisis, with sensitivity to power dynamics and values of care?

To address these questions, we reflect on our study that recruited a diverse set of 30 US-based families to participate in a ten-week study using the Asynchronous Remote Communities method in mid-2020. Participants responded to prompts that were divided into phases of 1) understanding the participants' and their needs, 2) refining their top concerns and assets, and 3) co-designing solutions, which were followed by reflection and debriefing activities. The key empirical findings resulting from this study, which are discussed fully in another paper [44], included the multiple, competing roles that parents took on during the pandemic and the five key design tensions in designing for remote or hybrid learning. This paper focuses on the experience of applying the ARC method for family-based adaptation to the pandemic from both the participants' and researchers's perspectives. We reflect on the methods' high engagement and participant retention in this ten-week study, the positive feedback and desire from participants to continue this kind of research participation, and opportunities for expanding this method with key stakeholders (such as educational decision makers) on themes such as parent-teacher relationship building and the methods' potential for building resilience.

Learning from our opportunities for increased self-reflection as researchers and conducting research during a collective trauma, the contributions of this work include promising potentials for a family-friendly method of engaging in mutually beneficial, remote research that is adaptive. Specifically, we believe that with scaffolding for building family resiliency— through open-ended style of co-design prompts and structured approaches to cross-family ideation— provides opportunities for learning, creativity, and social support at their own pace. With the uncertainty of the COVID-19 pandemic and future catastrophes, investing in family-friendly, remote research methods can ensure more input, participation, and inclusion from parents and children in participatory design research while inviting coping mechanisms through design.

1.1 Positionalities

Our research team consisted of professors and graduate students from two departments focused on interdisciplinary fields of human-computer interaction and information science within the United States. Two senior members of the research team are working mothers with school-aged children who were already mitigating the impacts of the pandemic on family life and were motivated to make an impact with this topic area by unearthing findings that could be applied to technology modifications or novel designs and uses, as they recognized that even with their privilege as parents in two-parent households with strong technology skills, jobs that could be done remotely, and above-average financial situations, childcare shortages still created significant challenges. We acknowledge that identities are nuanced and formed by the intersections of class, sex, race, disabilities, and many other categories. In the spirit of critical reflection, we disclose a key positionality of the racial makeup of our team: four of the team members are white, one is African American, one is Asian American, and one is Persian. Lastly, we deployed the ARC method because several members of the team had multiple, previous experiences with this research methodology and advocated for it as a good fit for our research participants (i.e., busy families adapting to intense times of rapid change and uncertainty). Specifically, we advocated for the method due to its asynchronous nature, low commitment on a weekly basis, and opportunity for social support and connection.

2 BACKGROUND AND RELATED WORK

Below we define the aspects that shape family resilience theories and the best practices of family co-design methods to inform our analysis of ARCs as suitable for building family resilience. We follow with overviews of critical HCI and trauma-informed research to lay the groundwork for our critical reflections.

2.1 Family Resilience Theory

Our study methods relate primarily to resilience- an area of interdisciplinary research from social science, policy, and public health that looks at the capacity to respond to and withstand stress [17]. There is great variance among schools of thought on how resilience is defined and evaluated. For example, an ecological perspective looks at contextual and systemic influences on individual resilience [17]. The dominant school of thought by Walsh et. al looks at family resilience as defined by: belief systems (such as displaying attitudes of hope, compassion, and grit), organization patterns (such as adaptiveness, community resourcefulness, and stable environments), and communication/problem-solving (such as shared discussions and decision-making) [62]. The Family Adjustment and Adaptation Response (FAAR) Model expands upon family resilience by showing how the family as a unit copes with stress by adjusting to demands and crises through meaning making and relying on capabilities [48]. Through reflective and creative exercises within the study, our participants had the opportunity to externalize their experiences within the pandemic in a structured, thoughtful, and sometimes playful way.

Family resilience theories currently have no universal standard of measurement, though modified scales have measured and validated family resilience with different demographics ranging from college students, rural communities in South Africa, to Chinese-speaking families [56], [34]). While these studies tend to assess family resilience over time, they have not studied family interventions as catalysts for resilience. Though our study did not measure resilience in a systematic way, we found emergent themes of expressions of resilience throughout the participants' online contributions and follow-up interviews.

2.2 Co-Designing with Families

Participatory Design (PD) researchers have also examined facilitating family interactions in design sessions [9, 49] to capture experiences that rely on both adult and child perspectives. In their literature review, Isola and Fails [31] found that while co-designing with families is an important area of consideration, it is also logistically difficult to do. Partnering with families in co-design is a collaborative process between intergenerational groups that often have differing needs [22, 24, 50]. Similarly, because of power dynamics between parents and children, Yip et al. [64] found that it takes time for families to become comfortable with each other before becoming invested in the design. Social bonds need to develop between child-to-adult and adult-to-adult. While there is difficulty in setting up and executing co-design and PD with families, there are many benefits as well. Huh et al. [29] demonstrated that co-design workshops with families from historically marginalized groups can be a scalable and informative approach to creating mobile health innovations. Uchidino et al. [58] noted that diverse families can also learn about design thinking as they engage in co-design together. For many researchers, co-designing and PD with families can be a way to triangulate multiple forms of empirical user data [24, 29, 50]. Despite studies on PD and families, less is known about how to co-design with families online because most prior studies focused on in-person or hybrid meetups. This study, using the ARC method, helps us to understand the degree to which remote co-design with families (parents/children) can take place, especially with logistical and infrastructure constraints.

2.3 Critical Reflections on Power

A core principle of PD includes identifying mutual benefits for participants [19]. In related PD literature, researchers have found that using participatory methods with children, parents, and families lead to benefits other than flexibility to overcome participation barriers. Several researchers [1, 5, 33], examined how empowering children's autonomy is a critical dimension of participation, and influences the outcome of design engagements. In addition to increasing children's autonomy, researchers can embrace uncertainty by making room for different, dissenting voices. For instance, creative methods such as cultural probes can create space for multiple or even conflicting views between family members [13]- thus supporting a distribution of attention to different family members (so the loudest voices are not the only ones heard). In parallel, researchers can engage in critical reflection before, during, and after research studies to bring awareness to power imbalances and possible negative consequences. Bringing criticality to research has been described as a lens and process where, *"...the way we perceive the reality is distorted by history, vested interests and power; by various critiques it may be possible to see through these distortions, and this knowledge may ultimately lead to empowerment of those who have been formerly oppressed by the distortions"* [30]. Every facet of how research is conducted- from the languaging of research prompts and questions to how they are shared and data is collected has the potential to empower, persuade, marginalize, liberate, or even exploit the research participants. While this is similar to unpacking bias, researchers write, *"Conversations about reflexivity differ from those of bias. The language of bias builds on the values of 'fairness' and 'objectivity', but conversations about reflexivity focus on how knowledge-creation is always a site of culture, power, and labor"* [28]. Thus researchers also have the power to redefine the roles and responsibilities of "researchers" vs. "participants".

2.4 Trauma-Informed Research

While IRB protocols exist to mitigate for possible harms during research, there is still a possibility that certain topics can re-traumatize participants or, with the case of the pandemic, unexpected traumas may occur that are inextricably linked with the research experience itself. With this example and the messy realities of the real world, formal processes like consent forms might not serve as enough protection. This research unfolded within a few months of the pandemic started so both the research team and participants were navigating constantly changing circumstances, orders about lockdowns, sickness, death, and overall uncertainty. Our shared experience was part of a collective trauma, changing every facet of our social fabric. While other PD researchers have recommended embedding social and mental support into design and research [42], [57], [38], specifically when working with sensitive populations, our research team did not include this expertise. Yet, participation in research can come as a form of catharsis. In exploring the different expectations, qualifications, and experiences between design research and therapy, Tad Hirsh identifies "therapeutic" [27]. He writes that, *"therapeutic pay offs and opportunities for personal growth"when participants are encouraged to talk about themselves in the presence of a sensitive researcher"* [6]. These experiences blur the boundaries between researchers and participants and raise concern for best practices of care before, during, and after a study- especially for a trauma that is still unfolding live (such as the early stages of the pandemic). While many examples of trauma-informed scholarship exist [12], there are many opportunities for the development of trauma-informed best practices, including opportunities for critical reflection, within HCI research.

3 OVERVIEW OF STUDY ENGAGING FAMILIES WITH AN ASYNCHRONOUS REMOTE COMMUNITY DURING COVID-19

This section provides an overview of the methods we used to engage families in an asynchronous remote community during the COVID-19 pandemic to provide background on the study that informs the reflections that are the focus of this paper. The overview of methods in greater detail, including participant recruitment, payment, and composition are discussed in depth in our previous work [44].

3.1 COVID Context

Schools and communities in the United States were widely unprepared for adjusting to the COVID-19 pandemic [8], leaving families with few opportunities to process their experiences, seek and receive support, and contribute ideas to improving their educational circumstances. While, pre-COVID society in the USA provided numerous opportunities to connect in the "third spaces" of the commons (such as libraries, community centers, sports games, etc.). As shutdowns took place with quarantine orders, many families found themselves isolated at home. Parents' roles evolved during the pandemic as they filled in the social-emotional and logistical gaps left behind from third places shutting down [47]. Whether parents lost their jobs, worked remotely, or worked as essential workers - they had to juggle multiple compounding responsibilities while supporting their children in the rapid transition to online learning. Families also passed the time and maintained their connection to the outside world through playing together in digital and hybrid ways [43]. As a result of so many activities occurring digitally by necessity, screen time usage surged and upended previous family screen time debates [59]. Meanwhile, intersecting consequences for many in the United States included a rapid drop of women leaving the workforce, mental health crises, and economic precarity [11, 45, 51].

3.2 Participants Summary and Group Composition

In total, 324 potential participants completed the screening form to express interest in the study. We screened responses to include participants who could communicate in English, owned at least one device (computer or smartphone) that supports the Slack platform, have access to a stable internet connection, and be the legal guardian of at least one child aged 3-14. In total, 33 families enrolled in the study and completed the consent process. This study was approved by our university's Institutional Review Board, and families provided consent (adults) or assent (children) by email to participate in the study. We recruited families from 14 states in the United States. On average, families enrolled in the study had between 1-6 children aged 3-13, and reported annual income ranging from below $10k USD to over $150k USD.

We assigned one parent from the family as the primary contact for the research team who would coordinate distributing materials and instructions for the design activities to the rest of their family. This parent was also the primary contact in the Slack group and interacted with the research team and other parents in the study. Members of the research team posted the weekly prompts for the study in the Slack channel, reminded families to complete their responses, made announcements, answered questions posed by families to the research team, and responded to family's postings to stimulate engagement. During the final interviews, the research team referenced personalized content by revisiting the responses from the screener survey. In reminding families about their responses early in the study, we aimed to capture any changes that occurred during the study related to their reported benefits and challenges with technology.

Following recommendations from MacLeod et al. for non-homogenous groups [39], we created three groupings of families with shared experiences. Group A (n=12) contained parents with diverse geographic locations, income levels, and number of children in the home. Group B (n=10) included single parents from racially diverse and middle-class backgrounds. Group C (n=11) included families who reported income levels in the lower half of our sample. We found significant differences in participation among the groups. Group A was the first group to enroll early, build rapport as well as momentum. They had high engagement and retention rates. Group B of single parents experienced significant drop-off and more stress. For example, one parent shared that she warned her employer of needing to take unpaid family leave because of the *"psychological strains from juggling remote learning for her child and work."* Whereas parents in Group A had different tensions, such as at times needing to share tight quarters with multiple adults working and negotiating childcare coverage "shifts". Meanwhile, families in Group C expressed themes of issues with access to wifi and not enough digital devices in the household to meet everyone's work and school needs.

3.3 Overview of the ARC Method

We conducted a 10-week ARC study, to safely conduct research while shelter-in-place policies were in effect, and to facilitate connections between families who wanted to share and engage with peer support and informal learning opportunities. We picked the ARC method for this population, as others have used it to study sensitive topics with vulnerable populations, including teens and stress, pregnant mothers, people with HIV, and transgender and non-binary youth [2, 36, 40]. Bhattacharya et al. [3] found that teens benefitted from the flexibility and selective disclosure afforded by the ARC method for design activities. Garg [23] found that parent and teen dyads appreciated the ARC session's flexibility, privacy, and opportunities to socialize with other participants. However, there remained an open question of how to engage in collaborative design activities between parents and their children and the potential benefits of the ARC method for building community and family resiliency.

Traditionally, asynchronized remote communities (ARC) involve multi-day or week structured participation in online groups, often centered around stigmatized or marginalized identities. Participation is broken down into completion of prompts or interactive exercises through an online forum. Affordances of ARC's include privacy (through an opportunity to use a pseudonym), access across geographies and timezones (due to its asynchronous nature), accessibility (by reducing the need for transportation or physical capabilities that face-to-face interaction would require [41, 52]. Utilizing ARC methods allows for an increase in accessibility, we can then produce replicable results providing greater access to participants across cultures.

ARC groups are typically structured on weekly activities that are meant to provide more details about a certain population or subgroups' lived experiences, while supporting participants to forge social connections with another. Thus ARCs behave as umbrella approaches that can interweave multiple methods, spread out over time. Activities might initially include casual ice-breakers, surveys, diary studies, persona or scenario development that can evolve into in-depth storytelling opportunities. While on the whole these activities can provide more breadth than depth, they also offer more holistic, intimate, and authentic insight for researchers than stand-alone methods such as interviews [39]. However, ARC groups can be challenging because of their constant need for continuous rapport building, moderation, and the possibility of the method privileging extroversion (which can hinder equal participation).

Since we wanted to connect parents from different demographic and geographic backgrounds, we used the Slack platform, which is typically used as a workplace communication tool [63], as it supports rich media sharing and engagement from multiple platforms (e.g., mobile phones, tablets, and computers). On Slack, we encouraged parents to create profiles with pseudonyms to maintain anonymity. Members of the research team moderated the Slack channel.

3.4 Study Activities

We included 9 unique design activities in the study, with weeks 5-8 of the prompts focusing specifically on co-design activities scaffolded to build off of each other, inspired by the "mixing ideas" cooperative inquiry method [25]. Activity topics included parent work needs, remote school experiences, and caregiving mediated by technology. To follow recommendations from previous ARC studies and MacLeod's guide [39], we included both recall and generative activities, such as reflection exercises (e.g. diary studies and creative writing exercises), to offer variety and encourage different engagements (see Table 1). To accommodate the family's busy schedules, we designed activities to last no more than 20 minutes, included low-complexity design tasks, and did not require synchronous participation in all design activities. During the interviews, we presented parents with examples of future methods of engagement to gauge their interest in different study methods.

3.5 Design Activities Adapted for ARCs

Any research team deploying the ARC method can review the blueprint of generic weekly prompts used in previous ARC's. Prompts can include introductions, diary studies, mad libs, surveys, etc. [16]. Inspired by the success of these types of prompts, we adapted four activities from MacLeod's guide to conducting ARC studies, the diary study, ranking of problems, open-ended solutions generation, and participatory design. For example, we adapted the ranking problem activity by sharing the top themes from the survey study screener about family's experiences with technology, and parsed the responses to create a list of technology-related concerns and benefits. Using this list we asked families to rank the technologies by personal relevance, rather than generating a list within the research team (contrasting to the "Problems" activity). Families participated in the final follow-up interviews synchronously with the research team by videoconferencing, using Zoom.

3.6 Methods to Enhance Resiliency, Engagement, and Creativity

In addition to previously used ARC activities like diary studies and problem ranking, we also modified methods to fit our topics of technology improvements and adapting life to the pandemic. Activities included writing a love or break-up letter to a piece of technology, information and resource mapping for navigating emergencies, "mixing ideas" for co-designing solutions, and writing a letter to the family's school principal about preferences for school re-openings. Table 2 shows the ARC activities and which aspects of family resiliency they supported. As mentioned above, family resilience processes include key activities within bolstering belief systems, organizational capacities (such as flexibility and mobilizing resources), and communication as well as problem solving. See Appendix 2 for the full list of family resilience description of key processes and subcomponents.

Engagement levels can vary in the ARC method [39]. To scaffold engagement among the participants, we built off of the contextual inquiry method of "mixing ideas" to encourage families to engage meaningfully with other's ideas [25]. In the "mixing ideas" section of the study (week 6-9), families reviewed the design ideas contributed by others, and were asked to create designs that combined previously shared ideas. We posit that this scaffolding of reviewing others' ideas and being instructed to combine them, enhanced creativity through inspiration from others and constraints. We also facilitated engagement by requiring comments as a part of the weekly activity assignments, and sharing new activities weekly to prevent families from losing interest. The data collection and analysis protocol for the study and follow-up interviews can be found in our previously published work [44].

Fig. 1. Table 1: Weekly Activities and their prompts for the Asynchronous Remote Communities on Slack

Phase	Week	Activity Name	Prompt Details	Generative or Recall
Understanding participants' needs	1	Introductions and Advice	After introducing themselves, parents were asked to share what advice they would have given themselves pre-COVID-19.	Recall
Understanding participants' needs	2	Diary study	Participants completed five different diary entries on their technology use	Recall
Refining the problems and benefits of technology use	3	Ranking and ranting and writing a letter to technology	Participants reviewed a list of top technology-related concerns and benefits (generated from screener survey responses and the diary study entries). They ranked the concerns and wrote a love or break-up letter to a piece of a technology.	Recall and Generative
Refining the problems and benefits of technology use	4	Information and resource mapping	Participants created diagrams of their information flows and resources related to work needs, remote schooling (or summer/after-school activities), and COVID-19.	Recall
Study Pause	5	*Study Pause*	Shortly after the murder of George Floyd, we held a study pause for participants and the research team to reflect and take action accordingly.	Generative
Co-design	6	Ideation	Through partnered brainstorming, participants created solutions to address some of the most chaotic moments of the pandemic.	Generative
Co-design	7	Idea refinement	Participants selected their top ideas and refined them with product names, descriptions, and sketches.	Generative
Co-design	8	Mixing ideas: Round 1	Participants created family technologies about COVID-19, supporting quality family time, addressing anti-racism, or anything else that felt meaningful to them, based on combining ideas shared by others.	Generative
Co-design	9	Mixing ideas: Round 2	Participants completed the "mixing ideas" prompt one more time with the latest batch of ideas shared.	Generative
Reflection	10	Letters about Fall 2020	Participants wrote a letter to their principal based on their desired types of support for remote schooling for Fall 2020.	Generative

Fig. 2. Table 2: ARC-based participatory and how they supported family resiliency.

Activity	Adaptation of ARC Principles	Family Resiliency Attributes
Writing a Love Letter or Breakup Letter	The goal with this activity was to further understand participants' lived experiences with technologies (similar to ARC activities like photo solicitation or storytelling). It was modified for a more playful experience with this prompt that would be entertaining to different age groups.	Communication/problem-solving processes (specifically: open emotional sharing, which includes sharing painful or positive feelings)
Information and Resource Mapping	The goal with this activity was to understand the ecosystem of information and resources that families lean on while navigating the pandemic. Previous ARC activities included drawing "circles" and placing participants in relationship to resources in their lives. Here we strived for an asset-based approach so that feels can more clearly see where they can lean on for support or where their gaps are.	Organizational processes (specifically: connectedness and mobilizing social and economic resources)
Mixing Design Ideas	Similar to co-designing solutions found in other ARCs, this was an extra layer of scaffolding that demonstrated success in design contexts with kids previously. This method affords more collaboration between families by asking them to blend one another's contributions.	Belief systems (specifically: making meaning of adversity) and Communication/problem-solving processes (specifically: collaborative problem solving)
Writing a Letter to the School Principal	This activity meant to serve as a concluding reflection piece that could also empower parents to advocate for their needs in school communities.	Communication/problem-solving processes (specifically: open emotional sharing and collaborative problem solving)

4 PARTICIPANT REFLECTIONS ON ARCS FOR SUPPORTING FAMILY RESILIENCE

In this section, we discuss reflections and feedback from follow-up interviews with participants. The themes below focus largely on parts of the study that worked well for participants. In our follow-up interviews, the majority of feedback was positive, whereas some of the negative reflections included difficulties learning to use the Slack platform and comments about not understanding the need to do multiple rounds of co-design and building off of one another's ideas. While our interviews skewed toward overall positive reviews of the method and study, we also had a failed attempt at creating a group of Latinx participants (more in the discussion below). Each takeaway is informed by a family resilience lens, such as how the ARC method scaffolded opportunities for creativity, humor, meaning-making, and connection. We also share findings on parents' reflections from the structure and formatting of the study.

4.1 ARC Affordances in Family Creativity

While there are many theories of creativity, we are using a commonly agreed upon definition where *"creativity involves the production of novel and useful ideas and products" to analyze the ARC's method to evoke creativity in families* [46]. When asked what worked well during the study, parents shared reflections about enjoying the novelty and pleasure

of reviewing both their own family contributions and those of others. P9_Group A shared she was *"surprised at how quickly her daughter came up with ideas."* Others shared that the weekly prompts were a great opportunity for family bonding through learning, reflection, and fun (P12_Group B). P7_Group A shared that for her family: *"We loved the study. We loved coming up with different ideas and being able to use our imagination and our biggest wishes. I think it really worked well for us to kind of go through together as a family on what we'd want to develop, digitally, because of COVID."*

Since parents were the liaisons for the Slack channel, P10_Group A reflected on how the weekly prompts created a new way to connect with her husband. She shared:

> "My husband and I, we don't spend a lot of time together at all. Or like, quality time together. We're in the house all day. So that (the study) gave us an excuse to be together. Coming up with ideas and names for them, it was fun and very different - versus talking only about moving, the kids, and cleaning…It was fun to daydream how things could be different" P10_Group A

Across the follow-up interviews, people shared that they enjoyed seeing ideas that they might not have come up with themselves. Even though the prompts of Weeks 7-9 were focused on whimsy and connection, some families also received practical benefits from prompts, such as Week 4's mapping. A parent from the single parent family group shared,

> "Thinking about the areas of support for the pandemic was helpful, because it got me thinking about it in a more concrete way by mapping it out. And thinking about ways to improve since this is clearly going to go on for awhile. Improve but also ask for support more. I don't think anyone wants to take on more kids. Well, I haven't asked anyone to, so maybe I just need to ask them to. Being able to map it out was helpful. - P13_Group B

4.2 Making Common Experiences Visible

This method provided timely social-emotional support in an anonymous way for strangers who were going through similar experiences in otherwise isolated ways. Through structured engagement in the ARC method, families could converge on shared experiences without additional pressure to curate social interaction with strangers. This mode of engagement also left space for families to avoid discussing traumatic topics that they were not interested in, and still benefit from support and positive interactions. Reviewing each other's weekly responses brought solace to many families. P7_Group A shared: *"...It didn't matter where people were, we were all in the same boat. That was pretty huge for me, it made you feel less alone in it. It was kind of a bonding thing for me to know that it doesn't matter where you are in the world, everyone's kind of feeling the same way."* Similarly, a parent from the single parent group reflected on the experience of writing a love or break-up letter to a piece of technology saying, *"It was great for me personally, and then also really nice to just feel that reflected in this…funny little community of other parents going through similar situations because it is, it was, it has been very isolating. So just any of those kinds of points of connection are really, really nice."* - P12_Group B. Lastly, P27_Group C expressed that one of the joys of Slack was being able to use memes and emojis in a playful way when making contributions and responding to others.

As facilitators of asynchronous remote communities, the researchers posted in the platform alongside the participants. When asked what worked well for participants, they shared that they appreciated receiving clear instructions with example responses, reminders to complete weekly activities, and that they liked seeing everyone else's responses to the same weekly prompts. The majority of participants had not used the Slack platform before but commented that it was generally straightforward and convenient to use. One parent shared, *"Slack is very parent-friendly because I*

can get to it on my own time." - P8_Group A. Meanwhile, the opportunity to participate via mobile devices had mixed responses. Participants liked the flexibility of accessing content on their phones, but some did not enjoy typing out lengthy responses on their phones or scrolling through up to a dozen responses from other participants. P25_Group C did not realize that Slack was accessible beyond mobile devices and shared feedback that the facilitators could have done a better job explaining the options for research participation.

4.3 Future Directions for ARCs

During the follow-up interviews, we asked participants to reflect on possible options for near-future participation by sharing their preferences for different formats such as another ARC, an interactive summit, and a webinar series (see Table 2). Two options were presented for another ARC: one combining parents and teachers to co-create solutions and another focused on anti-racism. The first idea emerged because a bulk of frustrations shared by families were about the remote learning experience. We found that it was particularly easy for certain children to slip through the cracks of remote learning, such as children with disabilities or those with limited digital access. For example, P13_Group B expressed an interest in an ARC with parents and teachers sharing a desire to learn to, *"make the remote learning experience applicable to different kinds of learning styles...That came up with my son. He's just started refusing to participate in the zoom sessions, because he was too shy. It felt more pressure from that, than just sitting in the classroom."*

The second idea as a continuation of the study, was an ARC focused on anti-racism emerged as a response to the Black Lives Matter protests, which our study paused during the peak of in early June 2020. This idea arose as a response to the study pause and considering how a focused ARC of this nature could support families that were craving more time and space dedicated to this topic. Most parents shared that an ARC focused on anti-racism would be helpful, where families could share educational resources, discuss current events, and support each other with advocacy in their communities and schools. Meanwhile, researchers could benefit from learning the about the approaches capacities required to skillfully facilitate an anti-racist ARC.

For some parents, a value would be in finding age appropriate ways to talk with children in accessible ways that decreased fear and confusion. As P2_Group A shared: *"When I'm trying to find [anti-racism] resources, I'm doing that work of trying to vet them for things my kids will understand. I think that's great because the more information you have, the more options you have"*. For others, like P23_Group C, a value in a group like this could derive from advocating for more representation in children's literature. She shares, *"We're doing better with representation, but the representation is very stereotypical and I just want to have that broader appeal to like different situations, you know? I read a lot with my son. And..like, why can't a Little Red Riding Hood just be a little black girl?"*. Regardless of the ARC topic, parents preferred ARCs to other formats primarily due to its ease of participation through flexible timing.

Fig. 3. Table 3: Future Study Directions in Order of Most Preferred by Parents to Least

Ranking (1 = Most Popular, 4 = Least)	Potential Study Format	Description
1	ARC involving both teachers and parents	ARC group involving parents and teachers with a focus on learning about each other's perspectives and implementing learning solutions
2	ARC focused on anti-racism learning and accountability	ARC group focused on anti-racism (such as sharing family resources, practicing difficult conversations, and advocating for local change).
3	An interactive summit on families and technology	One day summit/conference about the state of learning, possible solutions, and opportunities for collaborative problem-solving
4	A webinar series on the family life during the pandemic	A bi-weekly or monthly seminar series bringing together interdisciplinary experts about navigating the pandemic with topics like schooling and community-building.

5 RESEARCHER REFLECTIONS ON ARCS' SUITABILITY FOR FAMILY RESILIENCE

While the section above highlights participants' feedback on the ARC method, the section below offers the researchers' perspectives on ARC suitability for cultivating family resilience and best practices for adapting the ARC. We continue with reflections on how power dynamics between the research team and the participants evolved during the study and offer potential strategies for reducing harm and maximizing benefit for future studies.

5.1 Creativity as a Form of Resilience

Research has demonstrated the positive psychological impacts of participatory design for vulnerable children - such as developing self-esteem, skill-building and broadening their horizons, and having fun [54], [55]. Similarly, participatory design has been envisioned as design games where user participants develop empowerment, fun, interaction in a community of practice, and shared meaning making [18]. Building off of these benefits, we believe that the ARC method can provide ways in which families, or anyone going through challenging situations, can engage in collaborative co-design as a form of therapeutic response to crisis situations. This therapeutic response aligns well with the adjustment and adaptation phases commonly found in family resilience theory [48]. According to this theory, families face demands (e.g., stressors, strains, and hassles) during crises and need to flexibly build capabilities and gather resources to cope. Families must continuously balance the external stressors and their internal capabilities through mechanisms like meaning making of the situation (e.g., worldview, mindset, and identity formation as well as problem-solving, finding humor, etc. See Appendix 2 for the full list of attributes).

In the face of the worldwide crisis of the COVID-19 pandemic, families inevitably experienced the adjustment phase to disruptions in all realms of life including work, school, and community-building. As such, their capabilities of

managing intersectional stresses needed to evolve as well. Through in-situ reflections on the structured and reflective participatory design activities in our ARC method as well as the follow-up interviews, we found that co-design processes functioned as a way in which families developed coping methods to adapt and become more resilient. For example, in the information and resource mapping activity, one parent reflected on the resources they mapped out saying, *"I was happy to see that our most used resources were virtual therapy, our backyard and SNAP (benefits) and not TV or information. Many days it feels like we are relying on electronics or become obsessive of news coverage, and that isn't how I want us to be living right now... or ever."* A core tenant of family resilience theory is being able to reflect on and make meaning out of adversity and connect to extended networks of resources, and this parent was able to identify some preferred resources at their disposal [4]. The consistent, weekly activities themselves allowed families a chance to communicate, exercise creativity, and develop cohesion in flexible, asynchronous timing. By participating in the study with other families and building off of each other's designs, participants could connect over the shared experience of going through the pandemic together. Thus the ARC method allowed families to develop socioemotional bonds with others going through the pandemic while working at their own pace and psychologically processing the unfolding of the pandemic.

5.2 Adapting Online Communities for Parents and Children

While families overall had positive feedback for the Slack platform and the terms of participation, improvements to the process can come from simplifying a research focus, introducing hybrid participation, and building bridges between open-ended design and meaningful opportunities for social change.

Given that our study was only a few months into the unpredictable and dynamic times of the pandemic, our prompt topics were broadly about family and technology in the home, with a large variety of submitted ideas - ranging from tools for improving chores, co-working peacefully in the home, and mitigating interpersonal conflicts. A more targeted study focus, such as focusing on a specific demographic (such as single parents) or subtopic (such as decreasing social isolation during a pandemic), could yield more impact by improving the relevancy of design interventions. By involving marginalized populations in the process of identifying the study focus, HCI researchers can exercise their power and privilege by intentionally centering minoritized voices to participate in technology research and development. Engaging target populations in the identification of issues can improve both the relevance of study topics and envisioned solutions [26]. Communicating clarity about the study focus and possible study outcomes could also encourage more social cohesion and study retention, as participants might feel more bonded over shared identities or goals. However, depending on the sensitivity of the topic, specially skilled moderation may be needed (as voiced by P27_Group C when considering joining an ARC focused on anti-racism) as well as investment in culturally competent training and additional expertise or guidance.

Analyzing feedback from the follow-up interviews surfaced several best practices and opportunities for improved facilitation. Participants liked reminders to complete the activities and examples of answers to prompts. Areas of improvement include more thorough explanation of the platform - such as through an orientation, recorded videos, or on-boarding follow-ups. Optional moments for synchronous connection (such as a video call) could also help build community and build comfort for creative expression and collaboration. This might be challenging with participants across time zones but is an opportunity to create more cohesive social connection. When working with children in hybrid or synchronous co-design, we can leverage the principles of engaging in reflexivity, embracing improvisation, and treating them as active and empowered actors - as demonstrated by Yip et. al [35]. These in situ reflections, improvisation, and creative play can be incorporated into the ARC method. Lastly, the length of a study such as an ARC deserves careful consideration. Longer studies can support rapport and community building, as well as seeing experiences unfold

longitudinally, while shorter studies may have afford better retention rates through more concentrated momentum-building. A more topic-specific study could narrow the length of the study productively, as demonstrated by ARC studies that were 4-8 weeks long and focused on transgender youth and health education, pregnant women, and people living with HIV [36, 40, 52].

5.3 Power Dynamics and Working During Collective Traumas

Below we reflect on unique needs that surfaced from families of different demographics and consider the research implications for tailoring to their needs. The onset of applying for funding to launching our study was a quick turn-around. Our recruitment and enrollment strategy centered on breadth over depth and as such we did not tailor study design or approaches to the diversity of participants, even as we found that different groups had different needs. Authors have referenced the hierarchy of power between researchers and participants [7], where researchers hold the distinct authority to control the research context and expected outcomes [21]. As such, exclusion can emerge within the research approach or method [53] and within the decisions made by researchers that align with their priorities [37]. For example, once the groups were running, a team member joined who is fluent in Spanish. We tried to recruit Latinx families for a fourth group, but we were not able to screen, enroll, and retain enough participants. A lesson in this case involves more intentional study design and recruitment from the inception of the study, rather than retrofitting recruitment and study design efforts to fit a marginalized population, which reinforces the power differential between researcher and participant [10]. In another instance, a parent from the single parents' group expressed that at times it was difficult to complete a weekly family-based research activity because her child was with the co-parent. A more tailored approach to working with single parents could have included bi-weekly instead of weekly research prompts. In this case, children from two-parent households had an advantage to more easily participating than children from single-parent households. In both scenarios, parents with access to Slack were the primary participants in the study, representing the voices and contributions of other family members in their weekly participation. A dynamic like this was only revealed in the follow-up interviews and more opportunities to solicit anonymized feedback could have existed throughout the study.

Our study screened for participants with reliable internet and device access and we explicitly communicated that participation could involve taking and uploading photos or videos to our shared platform. However we found that in some cases, a need for having basic needs met took precedence over study participation. For instance, after several attempts for a follow-up video call interview with a parent from our low-income parent group (Group C), we offered a phone call. The parent revealed that due to COVID, she lost her domestic cleaning jobs and was not able to pay rent or access unemployment benefits. As a result her two children and a dog were staying in a motel room. Our research team spent the afternoon calling every home shelter within hours of her location, who were all full. In that moment, the roles between researcher and participant were blurred as we recognized an opportunity to support this family who had no reliable social safety net due to the economic impacts of the pandemic. Not only did the research team not foresee this as a possible occurrence, but we did not discuss a plan of action for mutual or organizational aid support, as needed.

Working with families who experience the digital divide and learning about the various experiences with remote learning as well as for kids with disabilities, revealed that more collaboration with key stakeholders is needed to address structural changes. Solutions like creating access to wifi for remote learning, gathering and distributing devices to families, and connecting families in need to housing and food extend beyond the scope of technology research. While we began the study with a desire to learn about technology innovation for families during the pandemic, we learned that marginalized families with precarious incomes needed less technology innovation and more access to social services

support. Future co-design research projects, such as ARCs, can include more decision makers and key stakeholders such as teachers, school administrators, policy makers, community-oriented NGOs, and foundations.

5.4 Reducing Research Harm in Shared Trauma

How might research prompts and directions need to be reconfigured during times of collective traumas? As the ARC method consists of weekly prompts, there is room to change the weekly agenda as the study unfolds - enabling extensive flexibility. Researchers pivoting to the needs of community members has been documented before. In the case of the Community Historians Projects the project team shared their process of *"reconfiguring our design intervention to focus on empowerment through design (rather than through a designed system). By reframing workshop activities to be clearly and immediately advantageous to the community members at each step, we had to back away from our initial goal..and instead attend to the ways in which community members would gain a meaningful experience through the workshops and documentarian activities."* The researchers went on to identify the goals of the project with the community members themselves which focused on skill development and practice [20].

Yet, it's important to recognize that the research team themselves was living through the uncertainty and shifting dynamics of the pandemic, navigating new responsibilities in community and family safety. Opening up a redesign of a study to be entirely responsive to participants' needs could have required significantly more resources (time, energy, money, and trauma-informed training) than our research team had. To that end, we reflect on opportunities to modify design thinking ideas to incorporate values of care.

5.5 Focusing on Comparatively "Small" Problems

Another tension that arose from this study was the idea of focusing on a seemingly narrow component of their lives–that is, improvements to the technology families were using for remote schooling–while there were much larger problems experienced by the families, including loss of childcare, loss of employment, fear of the pandemic, sick family members, protesting systemic racism, and in one family's case, homelessness. This was apparent when the open-ended creative prompts (also known as "blue sky thinking") led participants to propose technology ideas that were solving large problems like childcare or safety, rather than small problems like improvements to their school's classroom management system. Even the research team, who were also experiencing the uncertainty and fear around the pandemic, struggled to limit the scope of design activities toward the study's original goals of technology for learning and family connection. Both the research team and participants also encountered the collective trauma of unjust police violence and the need to protest. As a study team we decided to take a collective pause during the ARC and resume in one week. One possible strategy to address this tension may be to mix "blue sky" design prompts to allow families to fantasize about having control over the big problems while also including more concrete design activities on improving specific technologies they were currently navigating.

5.6 Adding Care to "Blue Sky" Thinking

Working with "blue sky" thinking, in which participants are asked to ideate new solutions is a commonplace design-thinking and innovation practice. Given its playful nature, it is often an appropriate modality for working with children [15]. As an invitation into a design research geared toward creating solutions, it can scaffold divergent thinking that can snowball into more creative thinking. As families were invited to ideate solutions for issues from their lived experiences, they were afforded an opportunity to reflect on benefits and challenges to life during a pandemic and this exercise may help to build resiliency through reflection and noticing opportunities for change.

However, scholars have also noted that, *"approaches to design thinking (e.g., "blue sky" ideation) have an ethos that can be exclusionary to communities that have historically faced systemic discrimination. For example, engaging in design processes that promote "blue-sky" ideas (or ideation without constraints) may exacerbate inequities by leading to infeasible solutions that ultimately frustrate underserved individuals"* [26]. We saw similar sentiments expressed in our study when one African American participant privately messaged a facilitator expressing their struggle continuing the project due to the emotional intensity during Summer of 2020 when thousands of protests were gathering in solidarity with Black Lives Matter movement. This participant had contributed a design solution of a "Statistometer" which centralizes police violence data in an accessible way. Our team responded with complete support for their desire to withdraw from the study and acknowledged the emotional intensity they were experiencing at the time. We also expressed gratitude for the family's contributions and offered compensated conversations to see if we could adjust the study to meet their needs. Our research team proposed a BLM-specific family channel, or a hiatus from the study to the participant. The participant responded that their family reflected on our approach and decided to continue the study with*out wanting to explore and of the options saying, "I was just a little overwhelmed with everything going on from covid to systemic racism that continues and life at home."* The expanded nature of the ARC (spanning multiple weeks), enabled this kind of care and attention to an individual participants' experience, giving the research team time to consider alternative ways of supporting their retention and participation in the study.

The family stayed in the study and continued to contribute design ideas like a tool that zaps distracting and conflicting messages that took away from the core messages of the daily Black Lives Matter protests. Since some study participants, specifically families with Black and African American or mixed race family members, were affected more than other participants we took care to support any decisions about withdrawing from the study and offered alternative, compensated ways to still stay engaged (such as through an exit interview or opportunity to stay in the study and skip exercises as needed). Where under "normal circumstances" the co-designed ideas could have focused on domestic and educational technology, for some families- such as those directly impacted by racist police violence or close allies- the co-designed idea focused on anti-racist activities. This mixed-topic focus of design innovation points to the possible reification of marginalization explained by Harrington et. al, *"That is, brainstorming 'blue sky' ideas is a luxury practice that marginalizes those who have endured life with systemic disadvantage and resource scarcity."* People whose basic needs are met and/or who do not suffer from systemic discrimination are more likely to feel unconstrained in their imaginative thinking while people suffering harms and oppressions may ideate about practical solutions, out of a sense of necessity.

In our study, we maintained the design-thinking modality while making space for pausing research activities, encouraging designs to be focused on anti-racist work, and checking-in with our participants. While we wanted to complete the study, we recognized that life was not "business as usual" and that the research team and participants could benefit from space and time to process the Black Lives Matter movement's current events. Even though "blue sky thinking" may seem trite in light of multiple, overlapping pandemics, we found that overall families enjoyed the opportunity to ideate together and create artistic renditions of their ideas, as well as learn from other families' perspectives (see the prior work for a summary and graphics of the ideas that emerged in the paper [44]. This is consistent with other HCI research using playful modalities, such as theater or co-design prompts, as an opportunity for cathartic expression. *"Naturally, HCI researchers cannot and should not act as therapists, but they could follow some valuable principles from therapy-based approaches. We see developments also within other disciplines indicating the potential of theater and therapy in the empowerment of different kinds of marginalized groups or communities."* [60]

5.7 Limitations of Critically Reflecting on the ARC Method

This ARC method (and its sub methods) were influenced by the contingencies of the pandemic (including urgency and trauma), the use of a platform that was new to many parents, and digital inequities. Since the research team was eager to capture the initial experiences of transitioning from in-person schooling to remote or hybrid learning environments, the process of study design planning, recruitment, and launching were expedited. As a result we also did not allocate time and energy to critical reflection for the research team as the study unfolded. Critical reflection could have created the space for being more responsive to both researcher and participants' needs and potential harm reduction. This sense of urgency is not congruent with the pace of community- and partnership-building that this kind of co-design study can benefit from. Lastly, additional longitudinal studies applying the Asynchronous Remote Communities method and co-design activities would be fruitful in analyzing family resiliency outcomes, such as improved capacities for coping with adversities through meaning-making, social connection, and problem-solving.

6 CONCLUSION

Family resilience, during the pandemic and beyond, is influenced by many stakeholders: from schools and health systems to workplaces and technology designers. Yet, there are few existing opportunities for structured reflection, play, and creativity for families. Our co-design research with 30 families over 10 weeks demonstrates the potential of Asynchronous Remote Communities with design-based activities to flex the muscles of resilience, in the face of adversity while gathering useful insights for design. As the pandemic continues and given future intersecting crises-such as climate change and economic precarity- family well-being is threatened. Here we share a reflection on methods, specifically ARC, that can support further development of trauma-informed and adaptive participatory design methods.

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A APPENDIX

A.1 Participant demographic table. Group, Participant ID, Races and/or Ethnicities Represented in the Household (self-described), Ages of Children in Household (in years), Household Income (USD), Weeks in Study, Devices in the Home, U.S. State. Device abbreviations: DC: Desktop Computer; CT: Computer Tablet; LC: Laptop Computer; S: Smartphone; TV: Smart TV, G: Gaming System; VA: Voice Assistant

Fig. 4. Group A

A: "The melting pot": group based on mixed incomes, geographies, and ages of kids in the home	P1_Group A	White. Asian-Pacific Islander	3, 10	$100k-$150k	8	DC, CT, LC, S, TV, G	AL
	P2_Group A	White	<1, 3, 3, 8, 12	$50-100k	7	LC, S, TV, G	MA
	P3_Group A	Asian-Pacific Islander	5, 8, 12, 14, 18, 21	$50k-$100k	6	CT, LC, S, TV, G	AR
	P4_Group A	White, Hispanic or Latino	3, 6	$50-100k	8	CT, LC, S, TV	WA
	P5_Group A	Black or African American	9, 9	> $150k	8	LC, S, TV, G	MA
	P6_Group A	White	4, 10	> $150k	8	CT. LC, S, G	VA
	P7_Group A	White, Asian Pacific-Islander	7	$100-150k	8	DC, CT, LC, S, TV, G	WA
	P8_Group A	White, Hispanic, Asian Pacific-Islander	5, 8	$50k-$100k	8	CT, LC, S, TV, VA, G	CA
	P9_Group A	White, Black or African American	10	$50-100K	8	DC, CT, LC, S, TV, G	ND
	P10_Group A	White	2, 4, 6, 8, 9	Prefer not to share	8	DC, CT, LC, S, TV	ND
	P11_Group A	White, Hispanic or Latino	<1, 2, 5, 9	$10k-$50k	8	DC, S	ND
	P32_Group A	White	3.5, 12	$100k-$150k	4	DC, CT, LC, S, TV, VA, G	WA

Fig. 5. Group B

B: "Single parents": From racially diverse backgrounds and most classified their families as middle class	**P12_Group B**	**White**	**9**	**$50k-$100k,**	**5**	**CT, LC, S, TV, G**	**WA**
	P13_Group B	**Hispanic or Latino, White**	**Not listed**	**$50k-$100k**	**3**	**CT, LC, S**	**WA**
	P14_Group B	**White, Asian / Pacific Islander**	**10, 12**	**$50k-$100k**	**7**	**LC, S, TV**	**WA**
	P15_Group B	**White, Black or African American**	**Not listed**	**$50k-$100k**	**6**	**LC, S, TV**	**HI**
	P16_Group B	**White**	**11, 7**	**$10k-$50k**	**2**	**LC, S, G**	**AR**
	P17_Group B	**Black or African American**	**12, 16**	**$50k-$100k**	**6**	**CT, LC, S, G**	**AR**
	P18_Group B	**White**	**11**	**$10k-$50k**	**6**	**LC, S, TV, G**	**IA**
	P19_Group B	**Sri-Lankan and Italian**	**Not listed**	**$100k-$150k ,**	**6**	**LC, S, G**	**CA**
	P31_Group B	**White, Middle Eastern**	**6**	**$100k-$150k**	**4**	**LC, S**	**GA**
	P33_Group B	**Black or African American**	**Not listed**	**> $150k**	**3**	**CT, LC, S, TV**	**VA**

Fig. 6. Group C

C: "Lower resource" group: Family incomes in the lower half of survey respondents	**P20_Group C**	**White, Middle Eastern**	**3, 4**	**$10k-$50k**	**8**	**LC, S, TV**	**WA**
	P21_Group C	**White**	**2, 3, 6, 9, 12**	**$10k-$50k**	**8**	**CT, LC, S**	**NE**
	P22_Group C	**White**	**4**	**$10k-$50k**	**8**	**DC, CT, LC, S, TV, VA, G**	**AR**
	P23_Group C	**Black or African American**	**3**	**$50k-$100k**	**8**	**CT, LC, S**	**NY**
	P24_Group C	**White**	**3, 9, 11**	**$10k-$50k**	**8**	**LC, S, TV, G**	**NE**
	P25_Group C	**White**	**1, 4, 6**	**$10k-$50k**	**8**	**LC, S, TV, VA, G**	**NE**
	P26_Group C	**White**	**13, 16, 18**	**$10k-$50k**	**8**	**CT, LC, S, TV**	**IA**
	P27_Group C	**Arab**	**5**	**$50k-$100k**	**8**	**CT, LC, S**	**IN**
	P28_Group C	**White**	**7, 8, 10**	**< $10k**	**8**	**S**	**TN**
	P29_Group C	**White, Asian / Pacific Islander**	**3**	**$50k-$100k**	**6**	**CT, LC, S**	**WA**
	P30_Group C	**White**	**11**	**$10k-$50k**	**2**	**LC, S, TV, G**	**WA**

A.2 Key processes in family resilience. From: Walsh, Froma. "Family resilience: a developmental systems framework." European journal of developmental psychology 13.3 (2016): 313-324.

(1) Belief systems
  (a) Making meaning of adversity
    - Relational view of resilience
    - Normalize, contextualize distress
    - Sense of coherence: view crisis as meaningful, comprehensible, manageable challenge
    - Facilitative appraisal: explanatory attributions; future expectations
  (b) Positive outlook
    - Hope, optimistic bias; confidence in overcoming challenges
    - Encouragement; affirm strengths, focus on potential
    - Active initiative and perseverance (can-do spirit)
    - Master the possible; accept what can't be changed; tolerate uncertainty
  (c) Transcendence and spirituality
    - Larger values, purpose
    - Spirituality: faith, contemplative practices, community; connection with nature
    - Inspiration: envision possibilities, aspirations; creative expression; social action
    - Transformation: learning, change, and positive growth from adversity

(2) Organizational processes
  (a) Flexibility
    - Rebound, adaptive change to meet new challenges
    - Reorganize, restabilize: continuity, dependability, predictability
    - Strong authoritative leadership: nurture, guide, protect
    - Varied family forms: cooperative parenting/caregiving teams
    - Couple/coparent relationship: mutual respect; equal partners
  (b) Connectedness
    - Mutual support, teamwork, and commitment
    - Respect individual needs, differences
    - Seek reconnection and repair grievances
  (c) Mobilize social and economic resources
    - Recruit extended kin, social, and community supports; models and mentors
    - Build financial security; navigate stressful work/family challenges
    - Transactions with larger systems: access institutional, structural supports

(3) Communication/problem-solving processes
  (a) Clarity
    - Clear, consistent messages, information
    - Clarify ambiguous situation; truth seeking
  (b) Open emotional sharing
    - Painful feelings: (sadness, suffering, anger, fear, disappointment, remorse)
    - Positive interactions: (love, appreciation, gratitude. humor, fun, respite)

(c) Collaborative problem solving
- Creative brainstorming; resourcefulness
- Share decision-making; repair conflicts; negotiation, fairness
- Focusing on goals; concrete steps; build on success; learn from setbacks
- Proactive stance: preparedness, planning, prevention