Culture in Action: Unpacking Capacities to Inform Assets-Based Design

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ABSTRACT

The field of Human-Computer Interaction (HCI) aims at securing a lasting impact for technology-based interventions in the context of social inequities. Increasingly, HCI scholars are proposing assets-based design as an effective approach towards this issue. Rather than starting from people's needs and deficits, this approach posits that design should start from a deep understanding of people's assets. A pending issue, however, is how to account for the situated nature of assets; that is, how to decide which asset to leverage and for what design purpose. Drawing from cultural sociology and shifting the emphasis from assets to capacities, we propose Swidler's theory of culture-in-action as an analytical lens for unpacking the complex relationship between capacities, goals, and structural limitations. Leveraging findings from a Participatory Design engagement with 35 Latino immigrant parents for envisioning parent-education technologies, we demonstrate the applicability of this lens. We contribute to HCI scholarship by further discussing *1)* how to analyze capacities' design potential, and *2)* the methodological particularities for collecting them.

Author Keywords

Assets-based; Capacities; Culture; Participatory Design; Immigrant Parents

CCS Concepts

•**Human-centered computing** → **HCI theory, concepts and models; Empirical studies in HCI; Empirical studies in collaborative and social computing;**

INTRODUCTION

While some technology-based interventions succeed in creating technology that aligns with people's practices, the issue of how adoption can continue after a project ends remains an important challenge [6,43,61,74]. This is decidedly a problem in situations where financial, emotional, and social resources are scarce [11, 74, 75]. Informed by work on community development [50, 56], health [8, 68], and education [58, 86], various Human-Computer Interaction (HCI) scholars have proposed *assets-based* design as an approach to secure lasting impact [12, 42, 47, 61, 83]. This approach highlights and leverages people's already existing—but often disregarded—*capacities and assets* rather than trying to fix a list of needs and deficits [39, 56]. Literature on assets-based approaches often uses the terms capacities and assets interchangeably; in this paper, we choose to use *capacities* and *capacity-focused* design. Our goal is not to rename assets-based approaches but to draw attention to people's agency and diversity of actions as they resist inequities. Our attention to capacities prompted a pressing question about effectively engaging in a capacity-focused design. We ask, how can one factor in the *situated* nature of capacities in design [8,47,83]? That is, how to decide which capacity to leverage and for what design purpose.

In this paper, we demonstrate cultural sociologist Ann Swidler's theory of *culture-in-action* [72, 73] as a productive lens for analyzing situated capacities in capacity-focused design. This theory proposes that culture shapes the capacities we use to act in the world. Culture, Swidler argues, is a *toolkit* of public symbols and social practices allowing individuals to develop capacities for constructing habitual ways of acting or *strategies of action*. Strategies demonstrate people's creative problem-solving skills. However, they can also encounter structural barriers and conflicts with other strategies. Strategies of action are, thus, a unit of analysis for unpacking individuals' capacities and their situated use. An in-depth view of people's strategies, therefore, becomes essential for understanding which capacity can support a particular goal for design. Further, it can unearth limitations for consideration.

We applied this lens in the context of designing more inclusive parent-education technologies. Through it, we analyzed data collected over a one-month Participatory Design (PD) engagement with 35 low-income *Latino immigrant* [1] parents in the United States (U.S.). This study was part of a larger three-year engagement exploring design pathways for supporting this population at the city of Atlanta [81, 82, 84, 85]. We present a culture-in-action analysis of two strategies of action we identified in our study. For each strategy, we describe the complex relationship between parents' capacities, goals, and limitations. Further, we discuss how this new understanding productively illuminated design pathways.

Our work contributes to the increasing number of communities in HCI engaging with issues of social justice and interested in designing for sustainable social change. Specifically, we discuss how a culture-in-action lens can enrich designers' perspective of what capacities are and how to use them in design. Further, we reflect on the data collection approach for enabling a culture-in-action analysis of situated capacities.

[1] We are aware that the term "Latino" homogenizes a diverse population. However, we use it to refer to our Spanish-speaking participants born in Latin America for it is the term our participants preferred to strive for unity as a community in the U.S.

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RESEARCH CONTEXT

To succeed academically, children often need their parents to access, make sense of, and provide enriching learning resources [3, 10, 51]. Sociotechnical systems of education, however, favor the practices of dominant groups, thereby lowering access opportunities for those less privileged [23, 24, 49, 81]. Low-income immigrant parents, for example, face intersecting factors (*e.g.,* limited familiarity with the native language, the school system, and parent-school technologies) hindering their ability to share and find useful resources [10, 16, 77, 81, 84]. Cultural differences also constraint the support these parents can receive; reading these parents' actions (*e.g.,* not being at school due to work, low online participation due to social fear) as disengagement, many school actors limit the support they are willing to provide [29, 58, 62, 76].

Over the past three years, we have engaged in ethnographic fieldwork with low-income Latino immigrant parents in the U.S. for illuminating a capacity-focused design of parent-education technologies [81, 82, 84]. Our previous research suggested potential capacities but which capacities to leverage for which design intention was unclear. To understand parents' situated use of capacities, we engaged with them in PD activities. Leveraging findings from this PD engagement and our previous work, we propose a culture-in-action [72, 73] process for analyzing the design potential of situated capacities.

RELATED WORK

We now describe the growing research in HCI espousing assets-based design for attaining sustainable social change. In particular, we highlight the need to better understand how people's capacities can inform design opportunities. We then introduce the theory of culture-in-action as an appropriate analytic lens for unpacking how to use capacities in design.

From Advocating for Users to Capacity-Focused Design

From its creation, the field of HCI has committed to advocating for the user, initially working for and later with them on creating technological artifacts that achieve lasting impact [2, 18, 59, 60]. To ensure positive, enduring impact, early on, the field espoused a human-centered design (HCD) that was driven by users' needs assessment and feedback [60, 75]. As the focus shifted from the workplace to addressing complex social issues, democratic approaches such as PD and Action Research [6,9,15,34,40,59] as well as design orientations [27], have expanded the discussion on how design could work towards social change. In particular, research has shed light on the adequacy of methods used for understanding vulnerable populations [18], the design practice within cultural encounters [36,54,57], and design approaches for incorporating the knowledge of vulnerable communities [9,34,63]. As a field, however, HCI still falls short of ensuring that technology-enhanced interventions produce a long-term, sustained outcome, especially in resource-constrained contexts [6, 43, 61, 70, 74, 83].

Borrowing from work on education [39, 58, 86], health [8, 68], and assets-based community development (ABCD) [50, 56], a growing body of HCI research has proposed assets-based design as a desirable path for attaining lasting impact [12, 42, 47, 48, 61, 83]. Advocates of this approach argue that the reason most interventions fail to ensure sustainability is a focus on addressing people's *needs and deficits* rather than on identifying and leveraging their existing *assets or capacities* [39, 58, 61, 68, 83]. Needs-based interventions, these scholars posit, convince people that they are plagued with problems they cannot address without outside help. From these scholars' perspective, existing design approaches in HCI are needs-based; that is, their goal is often to create better products [6, 43], which does not always translate to starting from a vision of capacities [61, 83]. Design, thus, ends up focusing on the creation of novel technologies for the "here and now," thereby hindering possibilities for long-term adoption and sustainment [6, 40, 43, 61, 75].

In contrast, assets-based approaches advocate working with individuals and groups in identifying and mobilizing their assets or capacities to attain a shared vision. The terms assets and capacities are used interchangeably in much of the assets-based literature [50, 56, 68]. We find though, that the term assets can be misinterpreted as one for identifying only positive features in a group. While we are not critiquing assets-based approaches, in this paper we use the term capacities as well as capacity-focused design to rather draw attention to the abilities that people put at use to solve their problems in the present. The term capacities shares a similar sentiment with Sen's capability approach [67]. However, the latter emphasizes abilities that could be developed in the future. In contrast, the term capacities refers to abilities that already exist.

Capacities can refer to the ability of using material resources. However, most disciplines draw attention to intangible ones such as knowledge, skills, wisdom, and diverse forms of capital like aspirational, linguistic, social, and resistance [8, 39, 47, 48, 58, 86]. To be clear, an emphasis on capacities does not imply ignoring people's needs; hard realities must always be faced [68]. It means to start a design process by understanding what individuals and groups already have so as to maximize lasting impact. Work on assets-based in and out of HCI, however, suggests that incorporating capacities in the design of technology-enhanced interventions might not be as straightforward; understanding the relationship between individuals, their capacities, and their wider environment often complicates intervention decisions [8, 47, 48, 83].

The work of Wong-Villacres et al. in designing for intersecting realities, for example, shed light on how the complex fluidity of capacities can affect design: the privileges and penalties that individuals experience are not static but dynamic traits that can shift [83]. Thus, what could be a capacity in one situation could be a limitation in another. Further, as [48] points out, factors such as culture can hinder the use of capacities for certain purposes, even when they exist and the community appreciates them. For successfully operationalizing capacities in technology design, it thus becomes essential to engage in an in-depth understanding of capacities' *situated* nature. That is, to unpack how individuals and groups mobilize capacities to attain goals, and from there, to envision which capacities can realistically support goals for design.

Culture-in-Action:

An Analytical Lens for Unpacking Situated Capacities

We reviewed several approaches from both HCI and cultural sociology that might help in unpacking situated capacities.

Following [68], we sought an analytical lens for explaining why certain capacities are used for certain goals and the limitations that can hinder capacities' performance. In particular we considered Activity Theory [38, 46], Bourdieu's theory of capital [7], Situated Action [71], and Swidler's theory of culture-in-action [72,73]. Previous work leveraging culture-in-action for exploring the role of culture in issues like learning motivations [21, 26] and technology appropriation [47] drove us to also consider this theory as a possible lens to pursue.

Activity Theory was promising: it offers a framework for explaining how cultural tools—or capacities—mediate the relationship between individuals, collectives, and goals within an activity system [46]. Further, it emphasizes human agency and recognizes the problems that an unequal distribution of tools can cause to the system. However, its rejection of social determinism leads it to underplay such problems, highlighting them rather as opportunities that can help to transform the system [1, 64, 80]. In order to acknowledge social limitations, we reviewed Bourdieu's theoretical insight about the uneven accumulation of forms of capital—or capacities—that society deems as valuable [7]. According to Bourdieu, existing mechanisms for acquiring capital (*e.g.,* from one's family) tend to favor those who already have capital. Other groups, thus, are unlikely to attain social mobility. While critical of structural limitations, this view is too deterministic for our purpose: it disregards the capacities that some groups mobilize to resist power. Looking for a middle point we then turned to Situated Action. This model's focus on the "everyday activity of persons acting in a setting" seemed to offer important opportunities for our purpose [71]. Its fine-grade level of inquiry, however, did not fit the longer span of our data.

Swidler's theory of culture-in-action provided a similar middle point but with a granularity of analysis more adequate for our data [72, 73]. This theory calls for understanding how individuals creatively use culture to solve problems without denying structural limitations. Specifically, culture-in-action proposes an image of culture as a *toolkit* of resources like symbols, stories, and rituals which, in turn, cultivate skills, habits, and styles in its user (*e.g.,* knowing how to read people and being able to carry on casual conversation). Individuals draw these resources from their toolkit to solve different kinds of problems. Over time, they use their resources to assemble persistent *strategies of action* for routinely attaining their goals. Both individuals' cultural toolkit and their strategies of action constitute their capacities to solve problems (see Figure 1).

The theory of culture-in-action also purports that the way culture influences action differs in *settled* vs. *unsettled* situations. During stable, *settled* situations the availability of certain skills and strategies of action highly influences how people choose their goals (*e.g.,* a person who knows how to read signs of loyalty will most likely pursue goals that place group loyalty over individual achievement). Over *unsettled* periods, on the other hand, people resort to examining their toolkit for reconsidering their strategies of action (*e.g.,* a person going through a divorce might turn to the wider culture—books and advice from other people—in search for insights on how to deal with love relationships). In both situations, however, existing strategies of action play a fundamental role; either they determine goals or they are tried out, reconstructed, or merged with other strategies to construct a new one.

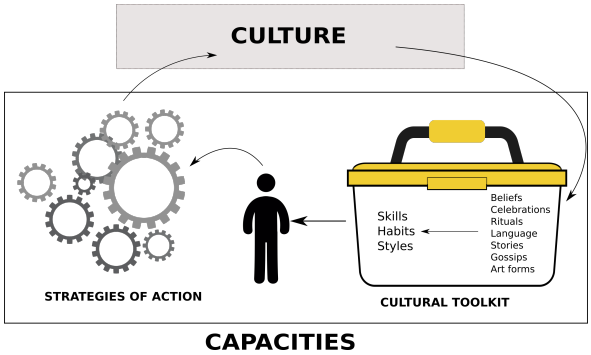

Figure 1: Visual sketch of the theory of culture-in-action

Culture-in-action's notion of strategies of action offers unique opportunities to an understanding of situated capacities for design. *First*, individuals' strategies reveal the creative ways in which people use their cultural toolkit. This can provide insights into how to use the toolkit's content for design. *Second*, looking at how strategies of action relate to goals can inform design decisions of what capacity to use for supporting individual's and groups' aspirational goals. *Third*, considering the structural limitations that impact individuals' strategies of action can illuminate possible constraints for design interventions to use the right capacities for the right goals.

METHODOLOGY

This work follows a three-year ethnographic fieldwork in 16 locations across the city of Atlanta, U.S., with over 300 low-income Spanish-speaking parents, mostly from México and Central American countries. For our current research, we leveraged our previous fieldwork locations to recruit two groups of 35 participants for a one-month (07/19) PD engagement. Although these were not the same participants from our original study, they belong to a similar demographic. For each group, our goal was to provide a trusting third space [5, 59, 69, 78] where participants could embark in the "path of expression" [66], culminating in their ability to (1) reflect on their capacities as well as everyday challenges with regards to parenting, information, and technology, and (2) imagine how to mobilize their capacities and technology to attain desirable futures. Drawing on [28], we used PD as a methodology for which facilitating participants' and designers' insights is as essential as generating tangible design outcomes. In that sense, we see PD as a long-term iterative process. We now describe our PD engagement, including field sites, participants, and PD activities. We also present our data analysis process using the theory of culture-in-action [72, 73] as a lens for unpacking how parents' capacities, goals, and limitations could inform the design of parent-education technologies.

Field Sites and Participants

We recruited parents from urban and suburban regions of the city of Atlanta, in the U.S. Our initial plan was to work with 15 parents (Group A) on a capacity-focused design process for identifying capacities and envisioning how to use them in the design of new technologies. Responding to a request from community partners, we also taught a technology workshop to

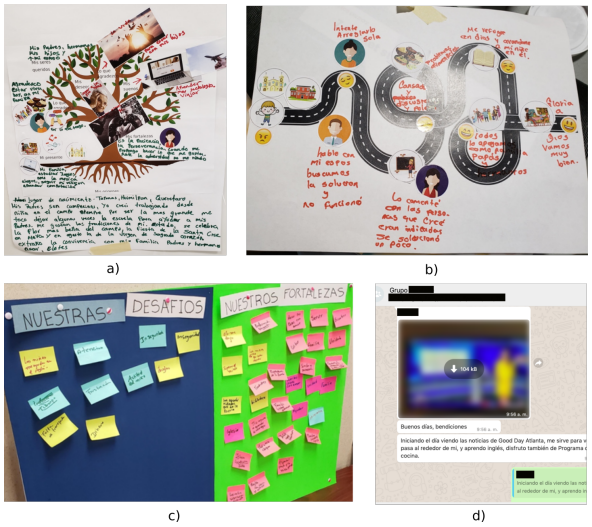

Figure 2: Artifacts parents created for reflecting on capacities and challenges: a) a tree of life; b) a parenting journey; c) a board of capacities and challenges; and d) a photo diary via WhatsApp Groups.

another group of 25 parents (Group B). We embraced this as an opportunity to further explore participants' capacities for managing information and technology. Five of our participant parents participated both in Group A and Group B, adding up to a total of 35 participants. Table 1 provides details of our field sites. The majority of our participants were from México (33), with a few from El Salvador (1) and Honduras (1). All participants but one were females (34); half of them lived with their partners. All participants belonged to low-income groups; over half of them held part-time jobs (*e.g.,* cleaning houses), and a few worked full-time (5). All had lived in the U.S. from an average of 8 years, and only one reported being fluent in English. Participants' educational attainment was diverse: 14 had not finished high school, 20 were high school graduates, and one of them held two Masters' degrees.

#Group	#Part.	Area	Site	District
A	5	L1	Public Elementary	SDA
	5	L2: Suburbs	Public Elementary	SDA
	3	L3: Urban	After-school Center	SDB
	2	L4: Urban	Catholic Church	SDB
B	25	L1: Suburbs	Public Elementary	SDA

Table 1: Details of field sites per recruited groups

Group A: Capacity-Focused Design

Across four weeks, we held a *two-stage* capacity-focused design process with small groups of participants (2-5) in each of our four locations. The *first* stage sought to elicit participants' reflection on their capacities and challenges with regards to parenting, information, and technology. Our experience working with this population suggested it would be counterproductive to ask them directly about capacities and challenges; these are not topics they think about on an everyday basis. We thus leveraged PD's capacity to scaffold participants' reflection on their own knowledge through making [21]. With participants' minds already set on capacities and challenges, the *second* stage invited them to imagine how to mobilize their capacities in the design of parent-education technologies.

Figure 3: Artifacts used for engaging parents in discussing and negotiating capacities and challenges: a) a word cloud with the capacities that parents identified in the previous session; and b) an information sources chart for ordering and rating resources to solve parenting challenges.

First Stage: Reflecting on Capacities and Challenges

To support parents' self-discovery process, we divided this stage into three steps across four weeks. *First*, we worked on building *reciprocal understanding* by inviting participants to visually represent and share their roots, skills, hopes, and dreams in a *tree-of-life* [65] (Fig. 2.a). *Second*, we engaged participants in three artifact-building activities for *eliciting an in-depth reflection* of their capacities and challenges:

- A *parenting journey* for participants to represent how they addressed a parenting challenge (Fig. 2.b).
- A board for parents to post the capacities and challenges of their fellow participants, as they identified them from the discussion on the artifacts that parents produced (Fig. 2.c).
- A two-week *photo diary* [79] for participants to share photos that answered questions about their everyday experience using capacities and facing challenges (Fig. 2.d).

Finally, the *third* step engaged participants in two more activities for *discussing and negotiating* the capacities and challenges of their community as a whole.

- A *group discussion* using a booklet with word clouds of the capacities and challenges we had identified up to that moment and the photos they reported on the photo diary activity (Fig. 3.a).
- An *information sources chart* for parents to order and rate the resources they use when managing parenting challenges (Fig. 3.b).

Table 3 provides a description of this stage's timeline, steps, and design activities.

Week	Location	Step	Design Activity
1	1st Meeting	Reciprocal Understanding	Tree of life
	1st Meeting	Reflecting	Parenting Journey
			Board of Capacities and Challenges
2 & 3	WhatsApp Groups		Photo Diary
4	2nd Meeting	Discussing	Word Cloud & Photo Booklet
	2nd Meeting		Information Sources Chart

Table 3: Details of Group A's first stage data collection process

a) b) c)

Figure 4: Participants' design process imagining futures for parent-education technologies: a) Reading "Don Ramón"'s letter (box of objects in the background); b) and c) Presenting their solutions.

Second Stage: Design via Fictional Inquiry

After participants discussed their capacities and challenges, we worked on imagining desirable futures for parent-education technologies. Our hope was for participants to spontaneously use their recently discussed capacities as they envisioned paths for attaining such desirable futures. Leveraging Fictional Inquiry [19], we presented participants with a narrative thought to empower them in imagining futures without feeling limited by socio-cultural or technological barriers. The narrative proposed a mash-up of "El Chavo del Ocho" and "El Chapulín Colorado" (two iconic Mexican TV shows well-known across Latin America [4, 41]). It described the parenting challenges of "Don Ramón," a beloved character from "El Chavo del Ocho" who, despite his financial struggles, always manages to take care of both his daughter and an eight y/o everybody calls "El Chavo" [the kid]. According to the narrative, "Don Ramón" had recently immigrated to the United States with his children and just found out that "El Chavo" was failing at school. Desperate, he turned to "El Chapulín Colorado"—a clumsy but well-intentioned superhero—for help. "El Chapulín" gave "Don Ramón" a box of objects that could be of help. However, these objects could only be of help if expert parents assigned them with magical powers. Participants found the box after returning from a snack break (Fig. 4.a). The box included objects such as a magnifying glass, a bag, a locket, a map, and a flute, as well as a letter from "Don Ramón," asking for our participants' help.

While "Don Ramón"'s story held many similarities with our participants' immigration experiences, it also kept differences that ensured emotional distance: "Don Ramón" had recently immigrated, had no support from a partner, and considered our participants as experts in issues of school and parenting. After reading "Don Ramón"'s letter, parents discussed his many challenges (*e.g.,* lack of time, lack of familiarity with technology, isolation). Working alone or in groups of two, parents chose a challenge to tackle as well as possible objects to use in their solution. As participants presented their artifacts, we prompted them with questions for helping them work out details. In total, participants proposed and enacted the use of 13 artifacts (Fig. 4.a and 4.b)

Group B: Technology, Information, and Community

Per the request of our community partner (CP) at L1, we taught a technology workshop to 25 parents. Over the last three years, we have built a trusting relationship with this CP, teaching PD-inspired workshops on parental control practices upon their request. Given the CP's satisfaction with our previous work, they were eager to collaborate with us in defining the topics for this PD engagement's workshop. The topics we defined with the CP's support entailed parental practices for *1)* parental control, *2)* online searching, and *3)* social media use.

Figure 5: Participants from Group B working on Participatory Design activities during our technology workshop

Over three two-hour sessions, the workshop leveraged PD-inspired activities for helping parents reflect on their current and aspired capacities with regards to the topics above. For each topic, we followed a similar *reflection-discussion-imagining* format than with Group A. First, parents performed activities for *reflecting* on their capacities to address particular challenges with technology (*e.g.,* searching for robotic classes for children, controlling children's use of technology at home). Then, they presented their process, and we engaged in a *discussion* about what they had discovered about themselves in those activities. Finally, parents engaged in activities for *imagining* aspired capacities (*e.g.,* creating ads for convincing their children of changing technology use patterns, using social media to create an online community). We then discussed how their current capacities could enable the aspired capacities and the challenges they foresaw in the process (Fig. 5).

Data Analysis

Our PD engagement was conducted in Spanish (the first author is a native-speaker). The data collected was in the form of field notes, photos, paper-based artifacts as well as audio and video recordings, which were transcribed and translated.

We collected data on parents' self-identified capacities as well as on parents' use of these capacities for designing parent-education technologies. However, drawing design insights from this data was a challenge. First, parents' self-identified capacities often clashed, producing constraints (*e.g.,* perseverance helped many parents pursue a form of support for children, but it also blinded them from other opportunities). Using participants' designs as a starting point did not help either: most lacked a direct relation with education. For example, many participants proposed artifacts that, instead of stressing on children's education, sought to help "Don Ramón" improve his capacity to foster family unity. A pressing question for us was to understand what these designs could tell us about parents' educational goals and their use of capacities for attaining such goals.

As described before, culture-in-action offered a lens for exploring this issue. This theory argues that an in-depth understanding of strategies of action can unearth people's capacities as they relate to goals. Drawing on culture-in-action, we engaged in a three-step data analysis process. *First*, through a deductive data analysis we identified the strategies of action that parents were using for addressing academic problems. This highlighted strategies such as 'giving *consejos* [nurturing advice] to children,' 'engaging in closeness with teachers,' and 'pursuing aspirational learning.'

Second, we sought to identify the goals each strategy pursued. To do this, we first deductively analyzed the data under each strategy to identify the problems that the strategy was trying to solve. For example, the strategy of 'aspirational learning' was trying to solve the social discomfort of being in a foreign country. The problem, however, does not tell us why parents choose a particular strategy; the goal does. To identify the goal behind the problem, we leveraged culture-in-action's notion that people are more likely to pursue goals for which their capacities are well-suited [72, 73]. We, thus, conducted an in-depth analysis of the capacities and limitations shaping parents' actions to solve a problem. Specifically, we looked into our data to answer the questions: "what are participants' well-developed capacities to solve this problem?" and "what limitations would prevent them from solving it?". For example, our data indicated that parents' capacities to solve the problem of social discomfort are control of their own space, appreciation of *superación* [personal growth] as a life goal, and the ability to find online resources for learning aspirational content (*e.g.,* a Facebook group with cooking recipes). Their limitations to solve the problem, on the other hand, are embarrassment and social fear. Juxtaposing both reveals that their overall goal is safe self-empowerment; that is, one where they are in control of what they learn with little opportunities for feeling embarrassed or failing in front of others.

Third, with this enriched understanding of parents' capacities and everyday goals, we now turned to dissect each parents' design for finding possibilities in them. For this, we first classified designs based on the problems they were addressing (e.g., social discomfort, children's academic issues, finding information). From there, we identified and unpacked the capacities, goals, and limitations behind each design. Per problem, we then compared the capacities we found before with the ones the designs were enacting. The difference between them revealed new design directions for us. For example, let us consider a design proposing head antennas for taking away "Don Ramón"'s fear of speaking English that will also send signals to ask for help to others in case it is needed. This design addressed the problem of social discomfort. The goal was still safe self-empowerment: the antennas were for "Don Ramón" to learn without feeling embarrassed. The capacity used was still the control of one's space. However, the component of connecting with people was new and revealed the potential use of new capacities for addressing this problem. From our analysis, we knew these capacities were often used for other different goals and could see that parents were considering it feasible for a new purpose. With this knowledge, we could envision new ideas for technology to support parents' desire for safe self-empowerment.

AN ANALYSIS OF PARENTS' SITUATED CAPACITIES

We now present the analysis of two of the strategies we identified in our study. We chose these strategies for they exemplify the complexities entailed in unpacking how capacities can be mobilized for design. For each strategy, we identify the problem it seeks to solve. Further, we offer an in-depth analysis of the goals behind the problems that each strategy attempts to address. This analysis also reveals the capacities that we saw parents mastering and the limitations they face. Some of these capacities might seem to misalign with dominant notions of optimal parenting and learning. Drawing on situative theories of cognition and learning [13], we explore how these situated, non-dominant everyday practices, together with parent-education technologies, can provide a scaffold for parents to reach their particular parenting goals.

"Consejos": Motivating School Education through Values

Research on Latino immigrant parents has highlighted *consejos*—nurturing advice—as a critical form of child-rearing support for this population [17, 29]. The practice of *giving consejos* also emerged from our data as a strategy of action that most parents leverage for a variety of motivational purposes. Further, across locations, parents identified it as one of their most essential capacities. Our culture-in-action analysis highlights the different problems that giving *consejos* tries to solve. Further, our analysis shows how this strategy can both support and limit parents in motivating children to attain academic goals. Based on parents' aspiration for learning more about how school works, we discuss two design pathways for mobilizing the capacity of giving *consejos*.

A Strategy for Solving Behavioral and Academic Problems

As we saw, parents resorted to *consejos* for addressing children's behavioral and academic problems. In both cases, we saw that parents give *consejos* in the form of short narratives that mix their life experiences and family's origins with an important load of values-based images like family, respect, sacrifice, and *superación* [personal growth]. Drawing on those elements, *consejos* seek to elicit emotions like guilt, pride, and fear that, in turn, can motivate a child to change their thinking and/or actions. Clara provides an example of giving *consejos* for addressing a behavioral problem. When Clara's daughters were sad after a bullying episode, Clara leveraged her family's origins—in this case, drawing a notion of classism from her toolkit—to elicit a sense of pride in the girls:

> *Some kids at their school had called me fat, and my girls were really upset. I tried to make them see where they come from and where those other kids come from [implying a worse economic situation]. I tried for them [her daughters] to see how they are valuable and how those kids calling me fat should not affect them at all.*

Our parent participants also gave *consejos* for addressing academic problems. Regina, for example, gave *consejos* that would elicit guilt for motivating her son to go to college:

> *My husband has already told him [Regina's son] that he won't help him financially [to go to college], so he has to get a scholarship. I keep telling him that he needs to have a clearly defined goal, that if he doesn't have a goal, he will achieve nothing in life.*

As most of our participants, Regina only used values-based resources (in her case *superación*) to craft *consejos* for motivating academic development. Roberto's unique case amongst our participants demonstrates how academic resources can be mixed with values-based ones to offer children more concrete *consejos* for addressing academic challenges.

> *When my daughter told me she felt she was bad a Math, I told her .. 'it's not about being, it's about believing.' Then I told her how I was the last of my Math class until*

the best students in the classroom refused to help me calling me a 'burro' [a dumb person]. I then swore I would prove them wrong. By the end of highschool, I was the best in my class. It is all about effort, I told her.

"Consejos" in Education: Goals, Limitations, and Aspirations

The next step of our analysis was to unpack parents' tendency to only use values-based resources for crafting *consejos* that address academic problems. This would help us see the possibilities of *consejos* as a capacity for design.

Most of our participants shared stories of having either limited or negative experiences with education. Regina, for example, shared: "I grew up working in the fields, and oftentimes I had to miss school. Besides, my parents never helped me with school stuff, so I ended up losing interest in learning." On the other hand, the large majority mastered a values-based discourse. In Regina's cased, she emphasized perseverance: "my strength is to be perseverant. When I set my mind to achieve something, I don't give up." In line with a culture-in-action explanation of strategies shaping goals [72, 73], when parents like Regina face an academic problem (*e.g.,* helping her son to go to college), we saw them choosing the end goal that the resources in their toolkit facilitate. For Regina, this goal is to *keep motivating her sons' values-based development* while hoping for her strategy to also drive an academic change.

All parents agreed, however, that for them to be more effective in how they motivate children's academic success, they needed to increase their knowledge of the U.S. educational system. Melina explained how this endeavor was challenging but valuable:

I didn't like going to my kids' school, but when my son started having problems, I began to go more often, and I learned a lot just by going. That's when I realized that if you don't know how things work, it's really hard to make an impact on children's education.

Designing with "Consejos"

Parents are already leveraging *consejos*—an everyday strategy that mixes notions of family sacrifice, guilt, fear, and optimism—to teach life-long lessons to their children. A pending design question then is: could we leverage this already effective, situated strategy to help parents learn how to harness the school system towards their children's benefit? A culture-in-action analysis of parents' designs sheds light on possible ways to answer this. Clara's "Mapa Optimista" [Optimistic Map] suggests that parents would see value in the possibility of giving more interactive forms of *consejos*.

By using the magnifying glass over the map, 'Don Ramón' can show 'El Chavito' [diminutive for 'El Chavo'] places both in Mexico and Atlanta, and talk to him about their moving to this city. 'Don Ramón' can show 'El Chavito' that, yes, everything might be different here, but there are also many opportunities to grow together as a family, as well as many fun things to do in this city and new friends to make.

This design confirms most parents' choice of solving an academic problem by pursuing a values-based goal—in this case, motivating El Chavo to reflect on mutual obligations among family members. However, "Mapa Optimista" also indicates that parents consider technology a feasible medium for crafting more vivid and interactive *consejos*. An interactive app, for example, could assist a mother who wants to give a *consejo* to a five y/o about being respectful and not hitting other classmates. The app can provide visual and audio resources that the mother can put together for crafting a visual narrative that, by eliciting guilt, sacrifice, or fear, can convince the child of not hitting others (*e.g.,* illustrating how children feel when others hurt them). Considering parents' goal of learning more about the school system, the same app could offer resources that embed academic content like the school's regulations on discipline issues. In this way, parents can teach their children via *consejos* while also learning about school-related topics.

An analysis of Beatriz's "Pluma Aspiracional" [Aspirational Pen] further illuminates our perspective on how technology could leverage parents' capacity for giving *consejos*:

With this pen, Don Ramón will realize that he needs to focus less on his job and more on his children. In the notepad, Don Ramón can write down information about his work/life balance, and it would magically show him the pros and cons of his decisions. For example, if he writes down that he works the entire day, the notepad can show him "your son will not be able to go to college."

Beatriz's design is actually an artifact that gives *consejos*. It uses values-based resources like family and *superación* to provide education-related information in a way that would elicit "Don Ramón"'s guilt, thereby hoping to change his behavior. This design confirms that parents are interested in learning about the school system. Further, it suggests that parents see technology-mediated, values-based *consejos* as a potential teaching resource for that purpose. Technology for teaching parents through *consejos* could take many shapes. For example, it could help teachers and other parents create videos with short values-based *consejos* about how school works (*e.g.,* what are possible consequences of not attending parent-teacher conferences). Conversational technologies could also intervene to answer parents' questions about the school system through values-based *consejos*. For example, to the question, 'what is the benefit of volunteering at school?', the app could answer with narratives of other parents' positive experiences when volunteering, especially stressing values-based images like family, *superación*, and sacrifice.

Securing Valid Support through Closeness

Our data highlighted that, when a serious academic problem arises, parents face what a culture-in-action theory calls *unsettled* times [72]: feeling insecure about how the educational system works, they try out different strategies to address the problem. One of the strategies we saw them frequently resorting to is attempting to *engage in a close relationship with teachers*. We first discuss the problem that this strategy is trying to solve and the challenges it faces to be effective. Despite the strategy's issues, we analyzed it to understand the goals and capacities behind it. We found that parents engage in closeness for securing an authoritative source of information that can help them with children's academic struggles. Based on parents' designs, we unearth parents' goal of access-

ing more actionable information for supporting children. We then discuss how technology could mobilize the unearthed capacities to help parents attain their goal.

The Limits of A Strategy for Addressing Academic Struggles

Our data showed that all our participants, at a certain point, had tried to get closer to teachers as a strategy to solve children's academic struggles. Indeed, across locations, parents identified teachers as their preferred information source for handling issues at school. However, in their *information sources chart* (as described in Methodology), parents assigned a low score (2.5/5) to teachers' ability for delivering effective information. This dissonance was grounded in parents' disappointment towards teachers' lack of willingness to engage in closeness with them. Esther's comment reveals the structural barriers limiting a closeness-based strategy: "teachers do not have the time to meet with 20 parents wanting to talk to them per day." As she explains, this strategy's failure entails further implications for parents' relationship with school: "some parents send notes and when the teacher does not reply, they think, 'oh, they [the teachers] don't care', and then parents stop trying."

This strategy, we found, can be ineffective even for parents who do succeed in their attempts for securing closeness. It can narrow down too much the possible information sources parents are willing to use. After finding out about the learning challenges that her son Miguel was facing, Melina devoted all her efforts to develop a close relationship with Miguel's teacher. At the end of the year, the teacher provided Melina with a folder of activities for Miguel to master over the Summer. During our meetings, Melina repeatedly mentioned how frustrated she was with Miguel's progress on those activities. However, she discarded other parents' suggestions to use different learning resources. "I first have to do what the teacher told me to do," she replied to them.

The Goals and Capacities Behind Closeness

Due to the many limitations of this strategy, it might be difficult to leverage it for design. However, recognizing it is still a capacity that parents are attempting to mobilize as well as one that is affecting their relationship with their main source of information, we decided to analyze it in depth. Our goal was to unearth other capacities this strategy might entail that could be productive for design. Lucia's experience illustrates our analysis. Like Lucia, many immigrant parents have developed distrust-based strategies for protecting their family and themselves. "I don't like to confide my problems to anybody else than my husband, my children, and God," she told us. This, however, tends to keep her isolated from diverse information that could help her family. When her nine y/o son started to show discipline and academic problems, she faced an *unsettled* time: "Looking back, those were hard days. I had no idea what to do, and prayed to God for an answer."

In line with a culture-in-action's description of people's conscious, exploratory behavior during unsettled times, Lucia looked into her cultural toolkit and found a strategy she felt could work: attempting to *negotiate information on a one-on-one interaction*, in this case, with the teacher. This is a strategy we saw most of our participants leveraging for most of their information-seeking problems, from finding a new apartment, to finding solutions for medical problems. As our participants explained, engaging in conversations with others—strangers or acquaintances who also speak Spanish—can be a powerful strategy to access information that responds adequately to one's needs. Lucia did not talked about her personal life with others; however, she used the strategy of negotiating information on one-on-one interactions for solving other information-seeking problems such as learning about new events at her church.

Using that strategy in the school context, however, was not an easy endeavor. Lucia mentioned several times that she felt extremely uncomfortable when having to gather information from English-speakers. She, however, decided it was still worth trying; being isolated from other information sources, she needed to secure a connection with *a trusting figure of authority* to tell her what to do. That was, thus, her end goal. Lucia resorted to her understanding of perseverance and *superación* to get the strength needed for doing what she felt she had to do. In her particular, case, it worked.

> *When my son started to do badly at school, I began going over there more often to talk to the teacher. I speak little English, she speaks no Spanish, but every time I went, I did my best to explain her my concerns. She ended up helping us a lot: she advised him and made him feel like he is valuable. Now we have a close relationship; she sends me notes letting me know how my kid is doing.*

Designing with Trust and Negotiation of Information in Mind

Our analysis suggests that *negotiating information* and *trust in figures of authority* are capacities that could be used in design. The question remains, however: for what and how? Technology already provides communication channels for teachers to send authoritative information to parents (*e.g.,* email, *SMS*, *Remind*, and *WhatsApp* messages) [83, 84]. An analysis of parents' designs reveals that parents would like these channels to provide richer information for helping children. Esther's and Regina's "Relicario y Reloj de Tareas" [The Homework Locket and Watch] illuminates parents' design aspirations:

> *'Don Ramon' has to wear the locket. The teacher inputs a homework schedule for 'El Chavo' in the watch. When it is time for 'El Chavo' to start working, an alarm goes off both in the watch and in the locket. 'Don Ramon' can then call home to make sure 'El Chavo' is doing his work*

This design confirms our previous finding: parents seek a *figure of authority*, in this case the teacher, so that they can trust the information they provide. By making the teacher responsible for sending a study schedule that "Don Ramon" can reinforce, this design also suggests parents' proposed goal for design is to receive more *actionable* information. Acknowledging that such responsibility might overload teachers, new designs that pursue this goal could rely on intelligent agents embedded in existing parent-teacher communication channels. These agents could offer teachers timely suggestions of information they could forward to parents. These agents could also offer parents the opportunity to *negotiate information* that meets parents' particular needs. For example, if the agent suggests a speech therapy resource, the parent can engage in a conversation with the agent about how to get to that location and the availability of translators in the place. Such kind of

solution, that diversifies the information in parent-teacher communication channels, can be of help for parents like Melina, who are in need for more trustworthy information.

SEEING CAPACITIES THROUGH CULTURE-IN-ACTION

The lens of culture-in-action illuminated *1)* the richness of capacities when working towards social change, and *2)* the design potential of unpacking capacities. We are already using these insights to scaffold a new PD engagement, now with school staff and supporting organizations. We plan to take what these actors generate back to parents for them to iterate on. In that way, we aim at navigating power relationships between schools and parents while still factoring in the capacities of all actors of the school system. We discuss the advantages of a culture-in-action lens for such a capacity-focused approach to design. Further, we reflect on the qualities a PD engagement should secure for emphasizing capacities over assets.

The Richness of Capacities

The growing body of work interested in designing for social change argues this can only be achieved through a holistic understanding of both groups' capacities and the structural inequalities that affect them [27,32,33,83]. HCI has developed different approaches for assisting to that end. Value-sensitive design highlights the trade-offs between human values, system design, and social forces [35, 53]. From this perspective, people's priorities (e.g., our participants' desire for closeness with teachers) are values that technology could support. Assets-based design in HCI, on the other hand, proposes to identify communities' productive traits (e.g., our participants' practice to give *consejos*) and from there, find ways to support, leverage, or amplify such traits [12, 42, 48, 61]. Drawing from assets-based theory, in this study, we instead emphasized people's capacities—the abilities they perform to solve everyday problems—to attain the needed understanding. We found in the theory of culture-in-action a productive analytical lens for unearthing capacities as well as their structural limitations.

From a culture-in-action perspective [72, 73], individuals' actions (*e.g.,* parents' attempt for closeness with teachers) neither depend on their values nor hold positive or negative connotations. Instead, they reflect the strategies of action that one develops to solve problems within a network of possibilities and limitations. It is precisely the emphasis on problem-solving what gives this lens its analytical power; it drives us to ask a series of questions about a strategy as a problem-solving tool. In the case of closeness, one would ask: Why closeness? What problem is closeness trying to solve? What capacities are needed to solve that problem? What are the limitations hindering those capacities?

Such detailed dissection of a strategy allows us to identify a wide range of capacities, including those that individuals are not aware of. Further, we can see when these capacities are successfully performed as well as when they fail, thus achieving a holistic understanding that can inform responsible actions in design. In this work, the culture-in-action lens illuminated how we, designers, understood the role that individuals' and communities' capacities can have in design. We believe this lens, however, can also be productive for guiding communities in analyzing the results of PD activities within capacity-focused, community-driven social design endeavors [52].

The Design Potential of Capacities

An essential tenet of a design practice that seeks to mitigate social inequalities is to facilitate people's empowerment through the development of their capacities [27, 28, 52, 55]. From a PD perspective, this entails working with participants "to ensure that the existing skill could be made a resource in the design process" [28]. While not always participatory, assets-based approaches align with the motivation of using a community's assets and skills as resources for interventions. Traditionally, assets, however, are defined as a person's or a community's positive traits. As such, uses for assets in HCI have mostly revolved around three types of actions: *supporting*, *amplifying*, or *leveraging* assets. For example, in HCI, Cho et al. identified *comadrazgo* [close friendship amongst women] as an asset that Hispanic families use for information dissemination [12]. They then designed an SMS system that sends notifications to parents about informal learning opportunities and leverages *comadrazgo* to ensure information dissemination across families. By looking at capacities as abilities that go beyond positive traits and that operate within a network of other capacities and structural limitations [73], the lens of culture-in-action can offer a broader range of roles for capacities in design.

In our analysis, for example, we saw that parents' effort to engage in closeness with teachers is a capacity, but one that is often ineffective for supporting parents' goals. Specifically, this capacity is limited by a series of factors, including teachers' ability and willingness to invest time in fostering bi-cultural relationships. Closeness, thus, becomes hard to leverage for design. A culture-in-action lens helps us see, however, that a valid direction in this case would be to further *unpack* this capacity so as to unearth other capacities which uses might be more productive. When looking at capacities rather than assets, it also becomes clear that people can use seemingly negative responses, such as fear and distrust, as capacities. The design uses for these capacities would indeed deviate from traditional ones, depending on how and when people use them. For example, if parents' fear is a response to protect their sense of self, design directions could explore other ways to build and protect their sense of self. If their distrust is to protect their families from being displaced, deported, or split apart, then we could look toward designs that build in security about their legal status in the U.S.

A capacity-focused approach, thus, offers a different view of what it entails to facilitate communities' empowerment. *First*, by diverging from only considering capacities that are productive and successful, it gives value to the everyday activities that community members might have never considered useful or valuable otherwise (e.g., distrusting strangers). *Second*, it allows the community to consider many more design directions, thus augmenting its power to imagine feasible changes towards empowerment. This new view, we believe, is one that can lead to more, richer opportunities for empowerment.

Participatory Design for Collecting Data on Capacities

While some assets-based approaches outside of HCI are participatory by nature (e.g., ABCD) [50, 56], existing HCI assets-based work had not relied on PD techniques so far. Inspired by its success in working towards the empowerment of those historically disenfranchised, including immigrants

and refugees [9, 22, 30, 31, 34, 52, 65], we leveraged PD for our study. Specifically, we used it as a method for creating a *third space* [69] for participants to engage in "reflective practices so they understand what they know and what they do not know" [20]. This entailed reflecting on their challenges and capacities as well as developing the confidence to envisage "how we could or should live in the world" [25]. We intend to continue our PD engagement with parents and school staff for pursuing the design goals that we (parents and researchers) identified in this first study. We now discuss the data collection process that can make an analysis of situated capacities possible. In particular, we recommend that a PD approach supporting capacity-focused design considers three goals: to ensure gathering diversity of experiences, to spend as much time needed in eliciting reflection, and to facilitate unconstrained imagination.

There is a strong agreement that HCI needs to engage with the intangible traits of human behavior, such as values, capacities, and skills [22, 35, 37, 44, 45]. Most of the methods proposed for supporting participants to reflect on these intangible traits acknowledge the relevance of scaffolding this process across different stages [22, 44, 45]. We posit that, when it comes to identifying and analyzing capacities, designers also need to secure a diversity of opportunities for participants' reflection on their knowledge. Identifying capacities can be especially hard for members of disenfranchised communities; they tend to underplay their knowledge and abilities [22, 50]. Further, to promote an in-depth reflection of capacities, participants need to see both their capacities and other participants' capacities from different perspectives.

We addressed this need by planning for a diversity of methods, each affording a different view on capacities. Some sought for participants to discover their capacities by remembering a challenging moment (*e.g.*, the *parenting journey*). Others enabled participants to recall their challenging experiences by exposing them to situations where they had used their capacities (*e.g., the information sources chart*). Others allowed them space and time to engage in everyday activities so that they could bring a fresh perspective when engaging in reflective tasks later on (*e.g., a photo diary*). All these activities together allowed parents to reflect on their processes: when those failed, when those succeeded, and why. Further, it empowered them to share their knowledge and even defend their position when in conflict with other participants. Promoting moments for conflict to take place also showed to be key for an analysis of situated capacities: by seeing instances of capacities that work for some and not for others, both our participants and ourselves were able to reflect on the limitations of certain capacities and anticipate those situations in design.

PD practitioners and scholars working in community contexts have stressed the relevance for design interventions to "respect and engage the community on its own terms" [34, 54]. To feel respected, community members need to take ownership of the environment where they can shape, create, and produce things [14, 63]. In line with the work of Brown et al. with refugees experiencing post-trauma [9], we argue that respect also entails giving the community as much time needed to create artifacts for reflection and perhaps even more so in the case of capacity-focused design. Participants from disenfranchised groups often need time to feel empowered, to recognize they have abilities that are worthy of discussion, and to communicate their strengths. Researchers/designers also need time, not only to understand what participants are expressing but to consider their actions and decisions so that they can shift paths if needed and devise new activities that might help to better elicit participants' self-reflection.

Bodker and Kyng recently argued that a "PD that matters" should have high technological ambitions [6]. With this statement, they seek to stress the relevance of engaging in projects that are critical of the power dynamics that existing platforms perpetuate (*e.g.,* Facebook). Further, they call for engaging citizens in creating alternatives. We share this perspective. Our long-term goal is supporting parents into creating new parent-education technologies that offer alternatives to existing ones, for the latter perpetuate issues of inequities within the educational system [49, 81]. However, from our study, we learned that for groups that face issues of inequity, designing for fulfilling technological ambitions needs to—at least initially—be highly scaffolded through imagination.

Once our participants had identified and discussed their capacities and challenges, they needed a low-demand yet powerful entry point into design. We found in Fictional Inquiry [19] a great ally for that purpose: it takes participants to realms where they feel comfortable and powerful and encourages them to use that empowerment for taking a glimpse of what could be possible. To work towards our purpose, however, the design tool needed to be culturally appropriate. We used one of the most beloved cultural pieces of all Latin American countries [4, 41], which elicited in participants a feeling of home. Further, we put the characters in contexts familiar to our participants: immigration, parenting, and schooling. Finally, we reversed the situation and asked our participants to be the experts assisting characters that they know are at a disadvantage and in need of help ("Don Ramon" and "El Chavo"). As a result, parents felt free to choose the challenges they wanted to address and the capacities they saw fit for those design goals.

CONCLUSION

The HCI community has shown an increasing interest in assets-based design as an effective approach for ensuring sustainable social change. This approach espouses to start the design process from an understanding of people's assets rather than from their needs or deficits. We respond to the pending issue of how to decide which asset to leverage for which design purpose by *1)* shifting the emphasis from assets-based to capacity-focused design; *2)* proposing Swidler's theory of culture-in-action as an analytical lens for unpacking capacities; and *3)* demonstrating this lens' potential in the analysis of data collected during a PD engagement with low-income Latino immigrant parents in the U.S. We discuss the analytical advantages of this lens for a capacity-focused design that contributes to sustainable social change. Further, we stress three qualities for a PD engagement to emphasize capacities: ensuring diversity of experiences, spending as much time needed in eliciting reflection, and facilitating unconstrained imagination.

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