Robots as Proxies: Negotiating Dignity, Legibility and Accountability in Accessible Social Participation

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Abstract

Robots are often framed as efficient helpers for older adults. We study a different role: robots as proxies that may support older adults' access to participation when being there in person is difficult. We conducted Speed Dating storyboard interviews with 16 older adults living in care homes and aging in place, prompting them to reason about robot-mediated action from both the sender's and recipient's perspectives. Participants initially treated proxies as practical extensions for acting at a distance. However, once the proxy entered hallways, streets, and family events, their reasoning shifted from what the robot could do to what its presence and actions might reveal to others. Participants raised concerns about when proxy action might expose need, misrepresent the person, or leave responsibility unclear. We frame these concerns as accessibility tensions in robot-mediated social participation and discuss three design directions for proxy robots: legible action, configurable presence, and authority contracts.

CCS Concepts

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

Keywords

Older Adults, Proxy Robots, Social Participation, Agency, Accountability

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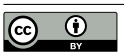

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1 Introduction

Robots have long been conceived as assistive tools for older adults, yet technologies for aging are often criticized for reducing later life to care needs and task efficiency, overlooking participation, contribution, and the social meaning of support. Increasingly, robots are also imagined as technologies that may support older adults' access to participation in family life, care infrastructures, and community settings when being there in person is difficult or inaccessible, especially as social connection and engagement remain important but often difficult to sustain in later life [37]. These barriers to in-person participation may involve age-related or mobility disabilities, inaccessible environments, geographical distance, or institutional constraints. Telepresence and social robots already allow remote participation in everyday routines, classroom activities, and social events, while mobile and service robots promise support with errands, monitoring, and logistics [8, 15, 30, 53]. Importantly, these systems are embedded in networks of relatives, care workers, neighbors, and institutions [20]. When a robot acts publicly as a proxy, it puts something into public view. A delivery, a check-in, or a visit can become a practical act and a visible social signal that others interpret, judge, and discuss. This shift pushes us to look beyond interaction quality and ask how robot-mediated participation may support access to social life, and under which conditions that participation becomes exposed, stigmatized, or difficult to sustain for older adults and others around the robot.

Understanding these consequences requires attention to what older adults value in their everyday lives and relationships. Their relationships with technology are molded by practical needs, values, social roles, and changing abilities [15, 16], with independence, dignity, social connection, altruism, and continuity of identity repeatedly identified as important in later life [4, 15, 59, 61]. These values shape how older adults may judge robot-mediated participation, including whether it supports contribution and social recognition or instead threatens dignity, independence, or identity.

Yet less is known about how older adults themselves imagine robots acting as proxies for such participation. We use *"proxy"* to describe a robot acting on an older adult's behalf, whether as

a directly controlled extension, a delegated representative, or a socially interpreted stand-in. Proxy use, therefore, concerns both extending action at a distance and the interpretation of that action by others in socially visible settings. When an older adult sends a robot to a family celebration, to help a neighbor, or to participate in a community activity, questions quickly arise about what the robot reveals, whether it exposes need or stigma, and how responsibility should be understood when something goes wrong socially.

Building on work on older adults' values and agency in HRI [15, 59, 61] and value-sensitive and ethics-oriented robotics [23, 67], we use Speed Dating [75] as an exploratory, scenario-based approach. Our storyboarded futures depict different robot typologies acting on behalf of older adults in everyday situations, including family rituals, neighborhood support, group activities, and meaningful past social roles. Because these proxy situations remain rare, varied, and difficult to study through any single platform or deployment, structured storyboards let us examine how older adults reason about access to participation, public legibility, selective presence, and accountability across contexts before narrowing to a specific system deployment [75]. We ask:

- *RQ1: How do older adults imagine robots as proxies for participation, action, and presence across community settings?*
- *RQ2: What tensions do older adults identify around visibility, stigma, control, and accountability when these robots act on their behalf?*

Participants reviewed and discussed storyboard scenarios in which robots mediated action and participation through different proxy roles and embodiments. Although participants initially treated these robots as practical means of acting at a distance, their reasoning shifted as soon as the proxy entered socially visible settings such as hallways, streets, and family events. Robot proxies may support older adults' access to participation when being there in person is difficult, but that access becomes fragile when proxy action exposes need, misrepresents the person, or leaves responsibility unclear. We therefore examine how participation through robot proxies depends on how actions are interpreted in public, how presence is configured across settings, and how authority remains understandable once the robot acts on someone's behalf. These findings offer design directions for supporting participation without unnecessarily exposing dependency, identity, or responsibility in public settings.

2 Related Work

When a robot acts *"on someone's behalf,"* it becomes a public representation that will be read through social norms and relationships. This representation can reshape what is disclosed, what is considered appropriate, and who is responsible [32]. This matters in aging contexts, where technologies are often introduced under narratives of assistance or empowerment, but their social consequences, such as dignity, stigma, trust, and accountability, play out in everyday settings and infrastructures [39, 64]. We situate our study across work on aging and values, robots for older adults, telepresence and representation, and agency and control.

2.1 Aging, Values, and Technology

While getting older often brings physical or cognitive changes, age itself doesn't define disability. Accessibility is shaped by our environment, social support, and stigma, which can make people hesitant to accept help in public. Ultimately, these factors influence how older adults interact with the world around them [15]. HCI research has long examined how well-being depends on the fit between individual capabilities and environmental demands [42], highlighting that technologies can both compensate for limitations and extend what older adults can do in everyday life. The balance of the physical environment, social relationships, and available technologies is therefore essential to supporting independence and well-being in later life [20, 40].

Older adults often prioritize values such as independence, dignity, and social connection [4, 40]. Recent accessibility research also highlights how social engagement and connection remain important but often difficult to sustain, and how decisions about disclosing difficulty or support needs are socially negotiated [37, 52]. Supporting quality of life, therefore, requires systems that focus on identity and what people find meaningful, rather than narrowly focusing on deficit or disability [27]. Value-Sensitive Design (VSD) and related approaches have begun to address these concerns in the design of technologies for aging and care [22, 59]. Recent work in social robotics further suggests that HRI involves recurring concerns and value tensions and that these need to be addressed in relation to the specific contexts in which robots operate [1]. Yet robots for older adults remain largely framed around care and task efficiency and may reflect developers' assumptions more than older adults' everyday wishes and concerns [63, 64]. HRI focused on accessibility and dementia technology research further call for attention to lived experiences, local infrastructures, and values beyond autonomy and safety, including justice, interdependence, and privacy [7, 31]. Building on this literature, we treat values as a starting point and ask what changes when those values are enacted through robots as proxies in everyday social settings, where actions can become publicly interpreted and consequential.

2.2 Telepresence Robots and Representation as Proxies

Robots are increasingly described as social or physical proxies that can represent people at a distance, mediate communication, or embody intentions [12, 13, 19, 30, 53]. Telepresence robots enable people to *"be there"* remotely, but participation in shared spaces is shaped by embodiment, bystander attention, privacy of others, identity presentation, and public legibility [28, 49, 50, 55, 72, 73]. Recent work also shows older adults can use robots as communication vehicles to send messages and objects to peers, shifting agency toward the older adult and treating the robot as an extension of their intentions [61]. Our work builds on this trajectory by asking what happens when proxy action moves beyond care-home peer interaction and into family, community, and institutional settings.

Prior work suggests that telepresence in public and semi-public settings is not solely a matter of access or immersion. In a study of shared outdoor geocaching through a Beam robot, Heshmat et al. found that remote participation was shaped by environmental

awareness, safety, unwanted public attention, and privacy concerns arising from bystander interactions [28]. Yang et al. similarly show that shopping over distance through a telepresence robot can support affection, familiarity, and joint participation, while also surfacing tensions around responsibility, dependency, contribution, and interactions with bystanders in a shopping mall [72]. Recent accessibility work on telepresence further shows that mediated presence can feel intensely exposing for people with non-visible disabilities, highlighting how telepresence can make one newly legible and scrutinized in shared institutional settings [73]. Related accessibility-focused HRI work also suggests that embodiment, privacy, and social demand are experienced differently depending on the task and user group, reinforcing the idea that mediated robotic support cannot be assumed to feel appropriate in the same way across contexts [45].

Outside of aging, telepresence and avatar robots have also been used as stand-ins for disabled people and homebound children in education and work. Telepresence robots have also served as proxies for homebound children in classrooms, raising questions about their participation, their representation, stigma, and recognition from others [51, 56]. Takeuchi et al. describe "avatar work," in which bedridden or severely disabled people perform customer service using an avatar robot, demonstrating how such arrangements can support fulfillment and social participation through tailored tasks and workload [65]. Work on physical proxies in remote collaboration further demonstrates how artifacts and robots can serve as the voice of people and extend their reach [19].

Crucially, previous studies show that *"being there"* with a robot is more than a technical matter and depends on infrastructure, local norms, and the reactions of incidentally present others. Beyond bystander attention in public space [28, 72], conference-based telepresence research shows that remote presence is socially organized through identity presentation, navigation constraints, privacy, local in-person support, and whether the robot is shared or dedicated to one user [49, 50]. Work at larger venue scales further suggests that the setting itself reshapes what telepresence can comfortably support in practice [55]. Newhart and Olson similarly show how telepresent participation of children is governed by teachers, administrators, parents, and school policies [51]. Recent studies also shift attention from adoption to the articulation work required to support values such as identity, privacy, and courtesy for remote attendees [17]. This question also resonates with recent accessibility work on mediated identity, where participants using inclusive avatars described tensions around whether a representation felt like "part of me" and what disability-related features should or should not be made visible to others [2].

FamilyDittos similarly examines a non-robotic mimetic agent that serves as a proxy for a remote family member, illustrating how such proxy interaction can support intergenerational engagement without physical robotic embodiment [66]. Our work extends this concern to mobile, materially present proxies whose actions become visible and interpreted in shared social spaces. However, this literature largely foregrounds access, usability, and remote participation rather than older adults' own reasoning about robots acting on their behalf across family, neighborhood, and institutional settings.

2.3 Robots for Older Adults and Their Caregivers

Robots designed for older adults have been largely framed around caregiving and assistance, including support for routine tasks, mobility, and safety [3, 46, 58, 62, 63, 74]. From the perspective of care infrastructures, robots are often positioned as tools to reduce physical demands and coordinate care through monitoring and physical support. Social robots have been explored as a way to mitigate loneliness, improve communication, and support cognitive rehabilitation [24, 35, 54]. Recent accessibility research with socially isolated older adults suggests that technologies for connection are valued, but also shaped by hesitation, barriers, and differing expectations about how connection should be supported [37].

At the same time, older adults' preferences for robot roles and interaction styles vary and depend on living arrangement, independence, relationships, and what feels appropriate in emotionally significant situations [21, 46, 63]. Although social robots can support autonomy by enabling valuable goals and psychological needs such as relatedness and competence [33], research also documents resistance when robotic assistance feels intrusive, dependency-enhancing, or misaligned with dignity and self determination [21]. Qualitative work further suggests that many social robots for older adults reflect developers' assumptions more than older adults' everyday reasoning, wishes, and concerns [64].

Such a body of work shows that what matters is simultaneously whether a robot can provide support, and whether that support feels appropriate to the person, the relationship, and the situation. We build on this literature by shifting attention from robots as care tools to robots acting *on behalf of older adults* in family and community life, where proxy action may help sustain valued roles, participation, and contribution, while also carrying social consequences around interpretation, disclosure, and accountability.

2.4 Agency, Control, and Contextual Adaptability in Robotic Design

Questions of agency and control shape whether robotic support feels empowering, trustworthy, and acceptable. Złotowski et al., for example, show that systems that balance autonomy and user control are more likely to be trusted and adopted [76]. Related work highlights that automation choices can either support autonomy or create disempowering experiences, particularly in assistive settings where dignity and self-determination are at stake [21]. Beyond immediate interaction, proxy systems can also redistribute agency by mediating actions and decisions on behalf of users, raising questions about who is represented, who benefits, and who is responsible for what the system does in the world [32]. Proxy use may range from direct teleoperation to delegated or partially autonomous action, and these configurations differ in how strongly the robot is experienced as "me," "for me," or as its own visible actor.

What counts as supportive or appropriate robot behavior is shaped by the social and physical contexts in which robots operate, as well as by how users understand control, autonomy, and responsibility [38, 47, 57]. Recent work on meaningful human control suggests that keeping people meaningfully in charge of autonomous systems requires attention to technical oversight, and also to how authority and responsibility are distributed in practice

[67]. Building on calls to design from older adults' wisdom rather than deficit framings [39], we examine what a proxy should do, what it should reveal, and how responsibility is understood when its actions extend into family, neighborhood, and institutional life.

3 Methods

We explored how older adults reason about robots acting as *proxies* in situations where participation, contribution, and social connection might otherwise be difficult. Because our focus was on robots acting on behalf of older adults across multiple social settings, such as care homes, private homes, and neighborhood life, rather than within a single deployment context, we used Speed Dating, a qualitative scenario-based design research technique suited for early-stage design exploration [75]. Speed Dating is a design research technique introduced by Zimmerman and Forlizzi [75], in which participants respond to a sequence of storyboarded hypothetical futures, eliciting participants' expectations, concerns, and normative judgments, including implications that extend beyond the immediate interaction. Speed Dating with storyboards has been used in HCI to probe ambiguous, emerging technologies and uncertain design spaces, surfacing expectations, boundaries, and trade-offs that are difficult to access through evaluations of a single deployed system [9, 10, 29, 34, 36, 43].

This approach was well-suited to our research questions. Because we asked how older adults imagine robots as public proxies across community settings (RQ1), and what tensions they identify around visibility, stigma, control, and accountability when such robots act on their behalf (RQ2), we needed a method that would let participants reason across multiple possible situations rather than react to a single deployed system. Speed Dating, therefore, allowed us to compare reflections across contexts, proxy purposes, and embodiments, using storyboards as prompts for reflection and comparison rather than as prototypes to be validated. Examples of storyboards are shown in Figure 1.

3.1 Ideation process and storyboard set

The storyboard set was developed iteratively to support our research questions about how older adults imagine robots acting on their behalf across socially visible settings. We began by reviewing relevant literature on aging, telepresence, proxy interaction, and social robotics, and then brainstormed a broad set of situations in which older adults might use robots to act, participate, help others, or remain present when being there in person was difficult. We initially generated 24 candidate situations, which were iteratively refined and narrowed to 15 storyboards. From this broader set, we developed candidate scenarios that varied along three dimensions: (1) *context* (e.g., care home, home, neighborhood/community), (2) *proxy purpose* (e.g., instrumental tasks versus socially situated actions), and (3) *robot typology/embodiment* (e.g., more mechanical versus more social or humanoid forms). We also included situations involving tasks older adults currently perform, as well as activities and roles they might value but no longer be able to enact in person as easily due to accessibility issues, so that participants could reflect on how proxy action might reconfigure capability, social participation, and recognition.

The final storyboard set consisted of 15 scenarios. Two authors led the writing and revision of the scripts, while a broader team of five researchers reviewed them across several internal sessions to refine the situations, clarify their intended tensions, and select the strongest scenarios for discussion. Only after agreement on the scenarios' communicative goals did we illustrate them. The storyboards were rendered by the first two authors for digital presentation and printed in A3 format to improve legibility during in-person interviews. Each storyboard was designed to be understandable without technical expertise and to invite reflection on feasibility, appropriateness, boundaries, and implications for other people in the surrounding social setting.

We piloted the storyboard set with four family members aged 65+ (two connected to the first author and two connected to the second author) to assess whether the scenarios were understandable and whether they elicited the kinds of reflection needed for our research questions, such as reasoning about acting on someone's behalf, what such an action might reveal, and how others might interpret it. Pilot participants were not included in the final study. Based on pilot feedback, we revised scenarios whose scripts were ambiguous or whose intended tensions were unclear.

The study was conducted in two iterative rounds with the same 16 participants. Round 1 used the initial storyboard set to map participants' understanding of proxy action across different settings. Round 2 then revisited selected scenarios for comparison and introduced revised or new storyboards designed to clarify and stress-test concerns raised in Round 1, such as recognizability, public interpretation, and responsibility when the robot acted in the world on someone's behalf. We did not aim for every participant to see all 15 scenarios. Instead, for each participant, we selected a smaller subset that balanced two goals: (1) relevance to that participant's life context and experiences, and (2) variation across context, proxy purpose, and embodiment. This allowed us to probe scenarios likely to resonate with a participant while still comparing reflections across different kinds of proxy situations. Across both rounds, participants discussed between four and eight distinct storyboards each ($M = 5.6$). Storyboard coverage was uneven by design because scenario selection balanced relevance to participants' experiences while varying context, proxy purpose, and embodiment.

3.1.1 Storyboard format. Each storyboard (see Fig. 1) featured a leading question that introduced the situation and prompted reflection on a consistent relational structure. An older adult character (Person A, e.g., "Helen") used a robot proxy to perform an action toward a recipient (Person B, or a group, e.g., "Joseph") within a specific social context. We used this structure intentionally to frame proxy action as something experienced by multiple parties and interpreted within a social setting, rather than as an individual interaction with a device.

The storyboards included explicit teleoperation, delegated task execution, and cases in which the operator or degree of autonomy was left underspecified. We did not aim to compare these modalities. This ambiguity was analytically useful when it prompted participants to question who was acting, whose intention the robot represented, and who would remain accountable. We used their answers to understand how people could relate to and act through robot proxies, not to test or judge one particular robot system.

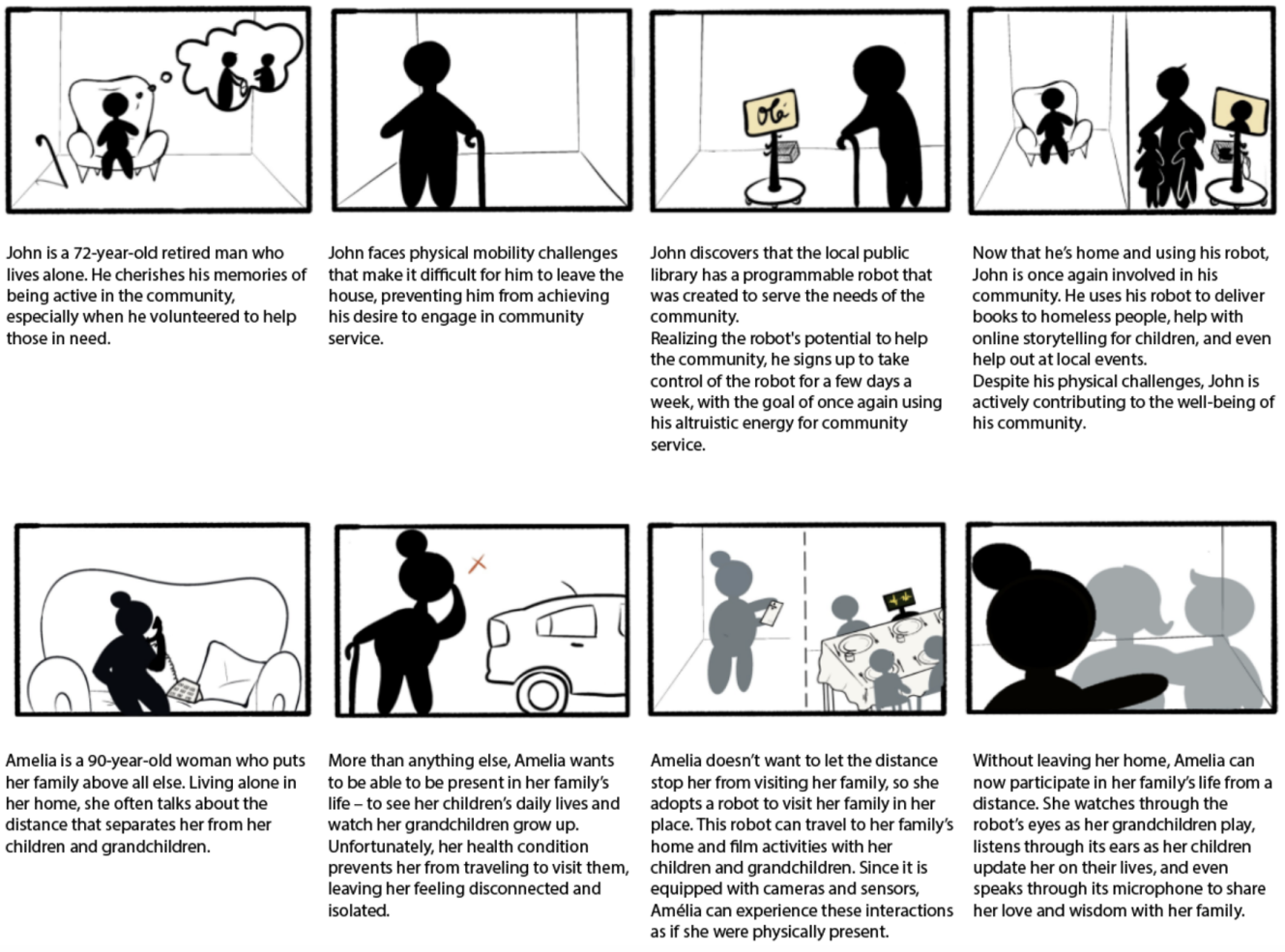

Figure 1: Two storyboard scenarios from our study. The top sequence shows a programmable robot supporting community participation when mobility limitations prevent in-person involvement. The bottom sequence shows a robot supporting remote family presence when physical distance or health conditions make travel difficult.

The scenarios covered social interactions, caregiving, remote presence, and community involvement. Participants were invited to reflect on their reactions to each situation, whether they would use or accept such a system, what would feel appropriate or inappropriate, and how the presence of the robot might affect others. Sample prompts included: *What concerns or hesitations would you have about robots in personal family settings? How might this affect other people around you? What would you want to control, and what could be delegated? What would feel inappropriate or risky in this scenario, and why?* Participants were also encouraged to challenge the scenario itself, propose alternatives, or explain why the situation did not make sense to them. The Supplementary Material includes a storyboard-by-participant coverage table, the leading questions, and the complete set of 15 storyboards. The materials are available online at this clickable link and are also listed in Appendix A.

3.2 Participants

We interviewed 16 older adults living in a care home and in private residences (aging in place), reflecting two common living arrangements relevant to how care, autonomy, and community participation are organized. We interviewed eight care home participants and eight participants aging in place (age range: 70–91; M = 79.0, SD = 6.0; median = 80). In the care home, we interviewed three male and five female participants. Among those aging in place, we interviewed four male and four female participants. The care home is a non-profit organization that provides social support to people in need. Participants in this institution were recruited with the help of two occupational therapists and a psychologist, who ensured that the individuals interviewed were cognitively capable of participating and had no dementia. Older adults aging in place were recruited in one village and two cities by word of mouth. Our university's Ciências Ethics Committee approved the study, and all participants provided informed consent. All participants lived

in Portugal, and recruitment covered one care-home setting, one village, and two urban areas.

3.3 Study procedure

Speed Dating sessions were conducted in person with the participants. We first collected demographic information, then introduced the study and obtained informed consent. We used the same storyboard materials and interview guide in both settings and followed a common structure across interviews: (1) demographic and contextual questions, (2) storyboard discussion, and (3) opportunities for participants to revisit or compare earlier opinions. Interviews and storyboard discussions were conducted in European Portuguese. Storyboard materials were presented in Portuguese, and quotations were translated into English for publication.

During the storyboard discussion, we presented one storyboard at a time. Participants first read the storyboard aloud, after which the interviewer used the leading question and a consistent set of follow-up probes to elicit reflection and comparison. These questions focused on appropriateness, control, and delegation, how the situation might affect others, and what kinds of risks or boundaries the participant perceived. The goal was to maintain a common scaffolding for discussion across participants, while leaving space for them to interpret the scenario subjectively.

For each scenario, we invited perspective-taking across roles. Participants were asked to respond as Person A (e.g., *"How do you see yourself as Helen in this situation?"*) and then as Person B (e.g., *"If you were Joseph receiving this action, how would you feel? Does that change your perception?"*). This role-switch was used to broaden reflection to stakeholders and to examine how proxy action might be understood differently when enacted versus when received. It was not used as an analysis category in itself, but as a prompt to surface expectations that might remain implicit.

To ground speculative reactions in lived experience, we also asked participants to recall analogous situations from their own lives. For example, we invited them to describe recent situations in which they had helped someone, received help, or navigated a similar social interaction in their family, care home, or neighborhood. We then asked how those experiences shaped what would feel appropriate to do through a robot proxy in that setting. These prompts helped connect storyboard judgments to participants' existing relationships and local practices rather than to abstract opinions about robots. Sessions lasted approximately 40 minutes.

3.4 Analysis

We audio-recorded the sessions and used an automated audio-to-text service to transcribe approximately 20 hours of interview data. We analyzed participants' responses using affinity diagramming [6], a common approach in Speed Dating studies [9, 10, 36, 43].

We first segmented the transcripts into analytically relevant excerpts, including reactions to a scenario, concerns or boundaries, comparisons between situations, and examples from participants' lived experiences. Excerpts were tagged by participant, living context, and storyboard scenario. Across multiple affinity-diagramming sessions, the first two authors clustered excerpts by similarity on a shared Miro board and iteratively merged and split clusters as interpretations developed. Participant and storyboard tags were retained throughout the analysis to preserve traceability. The team documented emerging codes, cluster definitions, and candidate interpretations, which were discussed with the wider research team and refined into the final themes. The de-identified storyboard coverage table in the Supplementary Material (Table S1) identifies which participants discussed each storyboard.

4 Findings

Our findings describe three ways of reasoning about robot proxies: 1) as practical extensions for remote action, 2) as visible forms of presence in social settings, and 3) as delegated actors in the world. These sections reflect analytic themes that cut across participants and scenarios, rather than a fixed sequence in the interview structure. Participants often began by discussing whether a robot could reliably support action at a distance. Their reflections then moved to how robot-mediated action and presence might be interpreted by others in everyday social life, including questions of visibility, recognition, stigma, ownership, control, and responsibility.

4.1 Robots as Practical Extensions for Remote Action

Across both living contexts, participants described robots as acceptable for functional and logistical tasks, particularly when proxy action addressed physical barriers or distance. Participants first approached robot proxies instrumentally, as tools that could extend action across distance, compensate for limited mobility, and remain under the older adult's control. They envisioned robots for functional tasks such as errands, deliveries, and remote visits, without expecting rich social or emotional interaction.

Participants described functional and logistical tasks as appropriate uses of robots, especially when the robot could compensate for accessibility constraints arising from physical limitations or distance, for example, cutting bushes or delivering groceries or medication. *"A robot is a machine, and machines are something that exist to help us, to increase our quality of life, mostly for people who are stuck in care homes or home-bound, or have accessibility and impairment issues."* P2. Notably, some participants initially described these benefits as primarily relevant to an imagined "home-bound" or impaired other, rather than positioning themselves as potential users, suggesting that accepting proxy support in principle could coexist with resistance to being personally associated with disability or dependence.

When participants framed the robot as a practical extension for remote action, they did not expect it to be emotionally expressive. They described it simply as a helper rather than something that required social or emotional skills, as P7 explained: *"In this case, I think the robot is already a great help. The affectionate, sentimental part doesn't come into play. It's solely about helping the person."*

P4 described the robot as *"a smartphone with arms and legs that I can control remotely and do tasks at a distance, or even delegate the task completely, and the robot goes itself to cut the bushes as an extension of me."* Robots used for remote participation in activities and travel were framed similarly, as acceptable ways to remain involved when bodies or circumstances limited mobility. Participants described these robots through the tasks they enabled, as P2 noted: *"In-person, it's much more beautiful than seeing it through a screen,*

whether it's a robot or a television. Nothing replaces seeing it live. However, it helps people, even if they can't leave their homes due to mobility issues, for example." Similarly, P3 reflected that *"...is always safer, less tiring… more economical… and perhaps even much more fun because you can go to places that you otherwise wouldn't be able to reach at all (because of potential motor impairments)."* This instrumental framing only felt legitimate when ownership and control remained with the older adult. As one participant put it, *"It's not 'you decide' (the robot). A machine that is an extension of myself will not be okay... unless I decide! It has to be 'I decide' over the robot!"* P6.

4.1.1 Caring for others through extended action. P5 and C3 described robots as a means to continue helping others through practical actions, such as delivering items or responding to routine needs. For them, the social value of the proxy lay in remaining the person who helps, gives, or responds to others' needs. P5 explained that *"...giving peace to people is priceless. Using a robot for this (a selfless act of helping someone in a vulnerable situation) is acceptable. A robot, machine, computer, whatever. It could be any robot. If it's doing what I believe is right for that person and if it's acting according to my will, it's good. I think the person would still appreciate my gesture, even if through a robot."*

In care homes, robots were envisioned as proxies for routine care, while residents felt they were the ones caring for their peers through a robot. *"If I had a robot like this, I would say, 'Fill this glass and bring it to the gentleman who has difficulty walking.' (...) It's not me, but the robot is acting in my terms, because I asked it."* C3. The value of the proxy was that it allowed participants to still be the person who acts, such as who brings water, sends food, helps a neighbor, or supports a cause, regardless of their impairments. Even if a machine, the proxy mattered more as a means of keeping the participant's care actionable and attributable to them.

4.1.2 Continuing to contribute through purposeful action. Participants wanted to remain useful and engaged. They imagined robot proxies as a way to continue contributing through purposeful action, especially when physical participation had become difficult. What mattered was that the action still felt meaningfully theirs, even if carried out through a robot.

P1, P4, P8, and C4 described robot proxies as ways to resist being "put on a shelf" after retirement, institutionalization, or increasing physical difficulty. *"It would be like me, as a flight attendant for twenty years. If there were a robot on a plane and I could manage things remotely as a cabin chief, it would bring me back happy memories and a sense of nostalgia. It would pull me out of my daily routine and fill me with purpose (...) I could feel like part of a plane again (...) especially because I cannot do it now since I am way older and would need help walking"* P1. P4 said, *"I wouldn't mind participating in my professional area to help solve problems. It's a way for retirees to stay active without feeling like they've been put on a shelf. I'd still be contributing remotely, without the pressure of being there physically (...) it would be like working remotely, as my son does, and so many people do today, but instead of being through a computer, it would be through a robot."* P4.

P8 described proxy use as a way to remain connected to roles and activities that had long mattered, such as *"...to do what (the storyboard character) always enjoyed. He feels useful to society, despite his age. He's not a nobody who's just sitting around doing nothing because of health limitations."* P8. C4 similarly described continuing to help despite institutional constraints, stating that *"Some people in care homes feel somewhat oppressed by their situation, unable to leave or participate (in society, outside of the care home). But they still have a strong will to feel proud and satisfied by helping. A robot would give them an advantage to help children in orphanages or elsewhere, through robots."* C4.

Participants emphasized that robot proxies could help them remain active, useful, and involved when physical participation was difficult. However, once the robot moved beyond practical action and into family, hallway, or community settings, attention shifted to how it would be seen, recognized, and interpreted by others.

4.2 Robots as socially visible proxies

When participants imagined robots in family and community settings, questions of utility became secondary, and attention shifted to social visibility. Robots were understood as devices that enabled action while also becoming publicly present objects that others could notice, interpret, trust (or mistrust), or judge. Participants therefore raised questions about recognition, legitimacy, disclosure, and what the robot might communicate about the person behind it or the person receiving help. We organize these concerns into two contexts: as proxy presence in family and intimate spaces, and the public visibility of proxy care in community settings.

4.2.1 Proxy presence in family and intimate spaces. A robot proxy was described as a way to "be there" when attending in person was not possible. However, participants differed in what that presence should mean. In family rituals and intimate settings, they wondered whether others would experience the robot as representing them in a meaningful way, and whether that presence would feel recognizable, appropriate, or emotionally sufficient. For some, the robot should be recognized and responded to as standing in for them. For others, its value lay less in being recognized and more in enabling them to witness what was happening from a distance.

P1, P3, and P4 articulated different expectations about whether a proxy should visibly represent them, allow them to observe from a distance, or count as their presence in a family setting. These questions surfaced across weddings, baptisms, anniversaries, and other family events. For P4, the issue was whether the robot would be perceived as them in a ceremonial setting where presence carries emotional and symbolic weight: *"I can only go if they (the family) take a small robot with them (personifying the participant) to show me what's happening, like at weddings, baptisms, or graduation parties. But I don't know. How would they perceive me there? Or talk to me? Am I there? Because I am not. Well, I am, but… if you get what I am saying. But I am unsure whether it counts as me"* P4.

Participants also differed in what the proxy should represent. Some wanted the robot to make their identity explicit, treating recognizability as part of what it means to "show up" in family spaces: *"At least the robot has to have a photo of me on the front of the robot. It has to have my identity. If it represents me to my family, it will have to have it (...) Maybe if the robot had my face on it, people would recognize it as my identity. I think that it is important if the robot is being me to my family, to have parts of me represented on it."* P1. Others were less concerned with how they appeared to others and more with what the proxy would let them perceive. For them,

the value of the proxy was less about "being seen" and more about "seeing others": *"The robot wouldn't have to look like me, it would have to do what I wanted, go to the places I wanted, but it didn't have to look like me (...) It's not important that they realize that I'm on the other side (controlling the robot), what's important is what I see."* P3.

A limitation was the sense that robot-mediated presence could feel emotionally thin, especially in regard to touch, warmth, and affection. Even when P8 and P2 imagined family members hugging the robot, they described a mismatch of closeness and distance, because someone *"...could hug the robot, and I could witness that through the robot cameras, because I am the one controlling the robot remotely, but it would feel distant, I wonder? Distant but close, I think, or even close but distant. Close to my eyes and my ears through the robot, but distant in terms of touch, like in terms of warmth."* P8. Meanwhile, participants were pragmatic, reflecting that when physical presence is impossible, a proxy can still be useful, even if it feels imperfect. P2 captured this *"better than nothing"* stance while questioning authenticity, saying that *"It's not the same as being there in person, but when you can't go yourself, it's something. It helps bridge that gap, even if it's never quite perfect, because it's never quite me (...) I don't know if it's a robot being me or me being a robot."* P2. Even when participants accepted robot-mediated presence as better than nothing, they did not describe it as a replacement for the emotional weight of "showing up" in person.

4.2.2 When proxy care becomes visible in public. Participants recognized that robot proxies could extend care and assistance across distance. At the same time, they emphasized that this help would not remain socially impartial once it became visible in public. When a robot appeared at a doorstep or on a neighborhood street, participants described the care as noticeable, attributable, and open to interpretation by others. The concern was what the robot was doing, but interestingly, what its presence might communicate about the person receiving help.

P8 and P2 worried that visible robot assistance could threaten their identity as capable and independent people. They imagined the robot as a statement that others might read as evidence of dependency. P8 stated *"I wouldn't want to be helped by a robot, especially as someone who lives alone. Do you see what that would say about me? (…) There are human social workers who can come and help me without it being such a visible signal."* Surprisingly, the concern was less about receiving help, even if through a robot, but about what using a robot would signal to the public. P2 made the reputational issue even more explicit by linking robot help to gossip and to the loss of a "still capable" identity. P2 said: *"People gossip about others (…) People congratulate me for being a widow, living alone, and still being capable (…) If I had a robot delivered to help me, I don't know if people would congratulate me (…) I fear that's what would happen to other people if I used a robot to help them, even if with good intentions."* For P2, the problem was the robot's social signal. Receiving help through it could make a person seem less independent, and sending it to help someone else could do the same by making their need visible in public. These accounts also show participants distancing themselves from a stigmatized identity of disability or dependence. Aside from the concern that the robot would respond to a functional limitation, its visible presence could publicly recategorize someone who understood themselves, and was recognized by others, as still capable and independent.

P3 also expressed a desire to know who was controlling the robot that would provide assistance. Anonymity could be interpreted as risky. P3 connected the need for transparency to protection against potential scams, mentioning that *"If a robot helps me, I want to know who's controlling it (…) People my age are often targeted with scams disguised as help or charity requests."* Beyond a simple delivery device, a robot proxy raised questions about who was behind the assistance, whether it could be trusted, and who would be accountable for it.

In other cases, preferences for visibility depended on the participant's role. P3 wanted to know who was behind a robot providing assistance, whereas P1 preferred anonymity when imagining providing charitable assistance. P1 stated that *"when it's about doing good deeds, I think it's nicer if it's anonymous (…) If I were the one receiving help, yes, I would like to know who is helping me (…) to know if I can trust that particular robot."*

P8 and P2 extended these dignity concerns to people with fewer socioeconomic resources, arguing that receiving help could feel embarrassing when robot assistance publicly signaled need. As P8 mentioned, *"Some people have 'shameful poverty.' They don't ask for help because they don't want to be seen that way. If a robot delivers food or goods anonymously, it's better for everyone (...) Often, (charity) institutions identify those in need and provide them with food and other necessities because they recognize them. They know a dozen people that know what's going on there (needing help), but they never say it's them."* Participants worried that robots could make help more visible than intended by activating local conceptions about who is "in need." P8 described how the idea of *"it's already the 4th time the robot goes there (to someone's house)"* becomes legible, stating that *"Whenever the robot appears, it unintentionally identifies that family as needing assistance."* This concern felt even stronger for households already seen as vulnerable. *"If it's an impoverished family, a robot to help them would only highlight even more that it's an impoverished family."* P2.

Participants expected that having a robot help them would still be subject to social judgment. Once a robot appeared in public on someone's behalf, care became visible, attributable, and potentially consequential for both giver and recipient. These concerns also led participants to ask who the robot acts for, who remains in charge once it is out in the world, and how accountability should be understood in practice.

4.3 Delegation, ownership, and accountability

P1, P4, C7, and P7 distinguished between operating a robot and having authority over what it could do in their name. Rather than treating the robot as a device "in their hand," participants anticipated that it would move through public space, be questioned by others, and potentially be constrained by external rules. This raised questions about who the robot was acting for, who remained in charge once it was out in the world, and who would be held responsible if something went wrong, regardless of the good intentions.

P1 was less concerned with whether a proxy could execute an action well, and more concerned with what it meant for a robot

to act in their name while they were physically absent. P1 captured this by contrasting a proxy with a smartphone, saying that *"I have a smartphone, which is mine, but this is different, because the smartphone is always with me, and the robot will not (...) It will have autonomy, probably to go around the street, but, I don't know. The responsibility will be directed to whom? The robot will be there and I will not (...) Even if my intention is to help, imagine that it makes a mistake… what do I do?"* What mattered was the fact that the robot could move through public space and be interpreted by others as representing someone who was not physically present. In this sense, controlling the robot did not feel sufficient, requiring clearer boundaries around what the robot could do, who it represented, and who would remain responsible if something went wrong.

This uncertainty became clear when participants imagined borrowing a robot from an institution. In P4's example, renting a robot from a public library raised a question, which was focused on *"when the robot is out in the world, who does it speak for? If I am renting but it does belong to the library, it's not my robot, I guess, but maybe for that period of time I am responsible, maybe? Like a rented car, I imagine (...) but we have a car license to behave in a certain way. We need driver's licenses to know how to behave on the road, right? I don't know if the robot has some kind of code of conduct for walking on the sidewalk and interact with people."* Participants described the robot as "my delegate, my messenger," but immediately questioned whether authority was theirs or the library's, especially if someone stopped the robot in public. As C7 exclaimed, *"So during that period, I'm responsible for that robot, right? (…) It would be my delegate, my messenger. My question is, who is in charge of it? (…) Is the authority mine or the library's?"*, showing concerns on how others might interpret who remained responsible when the proxy was questioned, denied access, or seen as inappropriate.

Participants also extended this concern beyond borrowing institutions to manufacturers and software systems, with P7 worried that even if a robot were "mine," its behavior in social situations could shift due to updates or company decisions that a user cannot control. *"My problem is related to the manufacturer (…) depending on the updates, the robot can be more or less bound to my authority. I notice that sometimes updates on my smartphone mess up some definitions I had already curated (...) And if the robot stops acting as I told him to? It could be embarrassing or worse, do something I didn't want and could not control, regardless of my good intentions."* This suggested that participants did not see authority as guaranteed simply by ownership. Instead, they questioned where their control may end and where institutional or corporate control may begin.

5 Discussion

Our findings show that older adults evaluated whether participation through a robot proxy would remain socially workable once the robot entered family, community, and institutional settings. Across the study, this raised concerns about public visibility, selective disclosure, and responsibility when a robot acts on someone's behalf. **Robot proxies may support older adults' access to participation when being there in person is difficult, but that access becomes fragile when proxy action exposes need, misrepresents the person, or leaves responsibility unclear.** From this perspective, accessibility in robot-mediated participation is about whether remote action remains socially workable in practice, including how proxy action becomes legible, how presence is configured, and how authority is understood once the proxy enters social life. This aligns with recent work arguing that accessibility is a situated process shaped by the barrier at hand, the options available to a person, and the contextual factors that determine which form of access is workable in practice [44]. Recent work focused on accessibility HRI similarly shows that robotic support must be designed in relation to lived experiences, local infrastructures, and the social consequences of introducing robots into communities, rather than assuming a single model of assistance [7]. Importantly, these possibilities should not be understood as substitutes for accessible transportation, mobility aids, human support, or more inclusive community and public spaces. Proxy robots may offer alternative and augmentative ways of participating in activities that matter to a person, but they may also individualize barriers that require broader structural change. Our stance is that proxy robots can support accessibility, but they should not replace broader efforts to make society and public spaces more accessible. We discuss these concerns through three design directions: legible action, configurable presence, and authority contracts.

5.1 Designing for legible actions of robot proxies

Our findings suggest that when robot proxies act in public, participation through them is shaped by how others interpret what the robot is doing. A robot proxy showing up at a doorstep, in a hallway, or in a neighborhood may be read both as completing an errand and as communicating something about the person behind it or the person receiving help. Participants worried that even mundane acts, such as delivering groceries or checking in on someone, could be interpreted differently depending on the setting, for example, as support, visible need, monitoring, or even a scam [18]. This concern is consistent with prior telepresence research in public and semi-public settings, where participants reported unwanted attention from bystanders, worries that others would assume they were being recorded, and the need to actively make the robot's presence feel socially acceptable [28, 72]. Our findings extend this concern by showing that, for older adults, public interpretation is also about dignity, dependency, and what robot-mediated help may reveal about a person. For proxies, this public interpretation becomes attributable to someone who may be absent, assisted, or represented through the robot.

Some of these consequences are not unique to robots; for example, repeated deliveries by a human volunteer, care worker, or delivery worker can also leave a visible social trace. The issue specific to a robot is therefore not the existence of the trace alone, but the way its physical presence changes people's interpretation of it. When a robot is used as a proxy, the represented person may be absent, the operator may be invisible, the level of autonomy may be unclear, and responsibility may be distributed among multiple entities, such as the user, institutions, and system providers. Parallel questions already arise in everyday arrangements, such as renting a car. People drive the car, but do not own it. People must follow the rental company's rules, and responsibility is shared across the

driver, the company, and the law. Robot proxies raise similar questions, but they also add new ones around autonomy, representation, and acting on someone's behalf.

When proxies operate in public, they may make care or assistance more visible than intended. Designing for legible action, therefore, means considering what a proxy does, and what the action communicates to recipients and bystanders. A grocery delivery may appear as ordinary support in one setting but as a visible marker of need in another [60], and repeated visits may accumulate meaning over time, particularly where receiving help is stigmatized [41, 68]. Prior work similarly points to the need for contextual explanations and privacy-aware behavior [14], while showing how robots can reproduce assumptions about frailty and dependence [70, p. 80–87]. In practice, legible action requires explanation and control over what proxy actions reveal in public.

5.2 Designing for configurable presence

Configurable presence concerns what a proxy reveals, to whom, and in what situation. A proxy can make someone "show up" in a way that feels legitimate, but it can also expose them or the person receiving help. Our findings suggest the need for different degrees of recognizability across situations. While legible action concerns how proxy *behavior* is interpreted in public, configurable presence concerns how the proxy *represents* someone socially. Proxy robots can create impressions that others interpret and evaluate, much like people managing impressions in front of an audience [25] and being held accountable for what their actions "say" about who they are [69]. Participants questioned whether the proxy should "count as me," serve simply as a window into a social setting, or remain anonymous. These differences may become more pronounced across proxy configurations, since direct teleoperation, partial delegation, and more autonomous action can each make the robot feel differently like "me," "for me," or like its own socially visible actor [49, 50].

Participants wanted things from the proxy depending on their role in the interaction and the social setting in which it unfolded. When imagining themselves as *recipients* of proxy actions, participants valued attribution for safety and legitimacy while wanting to avoid a public signal that would announce *"this is help,"* especially in contexts where receiving support can be stigmatizing. When imagining themselves as *providers* of proxy actions, participants valued lower-profile proxy actions that would not expose the recipient or create expectations of reciprocity [26]. In family and intimate contexts, recognizability felt important for legitimacy and for "really being there." In other situations, participants wanted the proxy to function more like a window into what was happening, without putting their identity at the center of the interaction. In community-help scenarios, anonymity was valued to protect dignity, avoid stigma, and reduce expectations of reciprocity.

The design problem, therefore, extends beyond whether the user can steer the robot to shaping what the proxy reveals, to whom, and with what likely consequences. Recent work similarly argues that identity-relevant robot behavior should be user-controlled rather than inferred, and that disclosure must be situational, configurable, and constrained by the social risks of a given setting [48]. Accessibility-focused HRI work with disabled people also suggests that embodiment, privacy, and social demand are experienced differently depending on the task and the user group, reinforcing that no single form of robot presence will feel appropriate in all contexts [45]. In practice, this suggests design opportunities such as adjustable identity cues and different levels of visibility for recipients and bystanders.

Proxy actions may also trigger obligations, gratitude, or a sense of debt, meaning that designing for presence in these cases means supporting acknowledgment without amplifying social pressure. The broader challenge is to support socially appropriate forms of recognition without making sensitive situations more publicly visible than participants would want.

5.3 Designing to support authority contracts

Proxy robots make questions of authority visible. Institutions may shape what the robot does and what it discloses, while the older adult may still be credited or blamed for its actions. Our findings raised questions about ownership, control, and institutional authority. Participants distinguished between *control*, who operates the proxy, and *authority*, who the proxy speaks for, under which rules, and with what accountability. These distinctions may become even more consequential as proxy systems move from direct teleoperation toward partial delegation or more autonomous action on someone's behalf [5].

Considering this, participants asked a practical question: when the robot is out in the world, who answers for it? Their concerns suggest that governance and accountability are key to making proxy action workable in real-world settings. By authority contracts, we mean clear boundaries around who the robot is acting for, whose rules it follows, and who is responsible for its actions once it enters public life. Related work on bystander privacy similarly suggests that these boundaries are technical, but importantly, a matter of consent, intervenability, and responsibility, because accountability is still expected to remain with the humans and institutions that design, deploy, and authorize the robot [14]. Participants likewise worried that acting "on my behalf" might still follow the institution's rules, not *"mine."* In-home HRI work similarly shows that robots entering family settings become entangled with existing routines, authority structures, and household expectations, sometimes shifting who remains responsible for what [71].

Authority contracts are not unique to older adults or to disability contexts. Their accessibility relevance becomes especially pronounced when participation affected by age-related or mobility-related disabilities is delegated to a visible, mobile proxy in a shared social space. In such situations, responsibility may be distributed across the older adult, a remote operator, an institution, the robot's manufacturer, and the system provider. Our claim is therefore not that authority contracts apply exclusively to this population, but that their consequences become particularly salient when access to participation depends on delegated proxy action.

Proxy robots may therefore carry out a user's intentions while also enacting the norms, permissions, and constraints of the institutions within which they operate. Prior work similarly suggests that robots can reinforce existing social norms and power structures

rather than function as neutral intermediaries [70, p. 200–201]. Acting through a robot may also involve system-imposed constraints on how one expresses oneself. In a teleoperated avatar-robot setting, proactive guidance sometimes limited operators' expression to support more appropriate, less pressuring interactions with vulnerable users [11]. This suggests that proxy robots may carry normative rules about acceptable conduct.

Designing for authority contracts means making these layered constraints and responsibilities more legible as proxy systems move into public deployment. Proxy systems may need clearer ways of signaling when a robot is directly teleoperated, when it is acting with delegated autonomy, and when its behavior is constrained by institutional or technical rules. Responsibility may also need to be communicated more clearly so users and bystanders can understand when the robot is acting in accordance with the older adult's intentions and when external rules are shaping its behavior [61]. In practice, this could include visible operating-mode indicators, institutional markings, or activity traces that help recipients and bystanders understand who authorized what kind of action.

6 Limitations and Future Work

Our study is exploratory and uses Speed Dating storyboards to examine how older adults reason about robot proxies rather than how they would respond to deployed systems. Participants' accounts, therefore, reflect expectations, moral judgments, and local social norms. Storyboard selection was adaptive, with participants discussing four to eight distinct storyboards each, but no participant encountered the full set. Finally, all participants lived in Portugal and were interviewed in Portuguese. Understandings of help, independence, and disability stigma are culturally and relationally situated and may differ across cultures.

Future work should examine these tensions through situated and repeated deployments, including how proxy actions become legible over time, how people configure what a proxy reveals and to whom, and how authority is negotiated among multiple stakeholders. Studies could also vary robot embodiment and anthropomorphism to examine how appearance and social cues shape recognition, discretion, trust, and stigma [12, 38].

7 Conclusion

This paper shows that robot proxies can extend older adults' participation when being there in person is difficult, but technical access does not guarantee socially workable participation. A proxy may successfully act at a distance while still exposing need, misrepresenting the person, or leaving responsibility unclear. When reflecting about using a robot as a proxy, participants asked what their action may reveal, how others will interpret it, and who remains responsible. We therefore argue that accessible proxy design requires requires *legible action*, *configurable presence*, and clear *authority contracts*, because together, these directions ask designers to consider what the proxy is doing, what it reveals about the person, and whose authority governs its actions. Ultimately, designing robot proxies means enabling participation that remains socially workable across family, community, and institutional life.

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A Supplementary Material

A.1 Study Materials

The supplementary materials for this study include the storyboard-by-participant coverage table, the leading questions for each storyboard, and the complete set of 15 storyboards.
All materials are available in the online supplementary materials folder.