

A stake in the issue of homelessness: Identifying values of interest for design in online communities

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ABSTRACT

Social media has the potential to impact how traditionally marginalized and geographically disparate communities, such as the homeless, connect with each other and social services online. However, little is known about how best to support these interactions through designing new information and communication technologies or by enhancing existing ones. Considering the *values* of stakeholders in an online community before embarking on design is one increasingly utilized step in designing for, by, and with traditionally disenfranchised communities. Current values-based design methods emphasize face-to-face interactions, but online interactions also provide spaces to elicit and consider values. This paper synthesizes the results of three studies into a suite of methods for eliciting shared values and conflicting values in online communities. This paper also contributes a survey-based tool containing value portraits as a first step towards implementing these methods. These methods for identifying values of interest to design contribute to a growing body of tools that support values researchers and designers in explicating values prior to, during, and in the evaluation of the design of ICTs.

Author Keywords

Homelessness, values and design, multi-stakeholder design, Twitter, technical support for marginalized communities, microblogging

ACM Classification Keywords

K.4.2 Computing Milieux, Computers and Society, Social Issues.

General Terms

Human Factors; Design

INTRODUCTION

Health and human services (also referred to generally as “social services”) in the United States are traditionally location-specific (e.g. city-level) government services to support individuals experiencing economic hardships like homelessness. Social media services (e.g. Twitter) have the

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potential to impact how such groups connect with each other and government services online. However, little is known about how stakeholders in this sector – including social service organizations, homeless advocates, and the homeless themselves – currently use social media. Less is known about how and what we can learn from individuals already using these technologies to further support the design or enhancement of social services online for existing communities as well as potential communities that might be formed as a result of design interventions.

Considering the role of *values* among stakeholders as a first step in new technology design is one increasingly utilized approach in designing for traditionally disenfranchised communities and associated stakeholders [20,28,29,44,45,46]. Values, or “guiding principles of what people consider important in life” [2], are criteria that people use to evaluate their behaviors, respond to people they encounter, and make judgments about events [35]. They shape the technologies we create and guide our information behaviors and practices [10,11,18,38]. Current values-based design approaches emphasize inductive face-to-face interactions through qualitative interviews, photo elicitation techniques, and hands-on design activities, among others. While valuable, these techniques rely on an accessible, location-specific population. They also make analysis across studies and groups a challenge due to the variability of values that are considered in each case.

This work explores how values elicitation methods can be used to reach distributed online communities. It examines values that emerge during online interactions, and explores how to capture these values authentically as a first step in the design process. In this paper, we describe a suite of content analysis and survey methods for identifying values of interest, such as shared values and conflicting values, *a priori* to the design process. These methods are grounded in a conceptual framework influenced by the value sensitive design literature, which we have operationalized and tested in a series of empirical studies conducted over the last two years. Although we conducted these studies within the context of the social services domain in the United States as a starting point, we feel that the approach can be adapted for other types of multi-stakeholder groups across domains and regional contexts for the purposes of eliciting values of

interest to design for online communities and sociotechnical systems.

BACKGROUND

We frame the utility of the methods outlined in this paper by first summarizing the current research showing the myriad ways in which individuals experiencing homelessness in the United States access their online communities through mobile technologies and public computers at day shelters and libraries. We then describe the link between values and the role that they play in technology design research and practice. In particular, we describe the growing body of literature that emphasizes values in the interrogation and design of information and communication technologies (ICTs) among marginalized groups and their associated stakeholders.

Homelessness and ICTs

The proliferation of web-enabled mobile devices and public computer labs in the United States has expanded who has the ability to participate in communities online. In a national study in the United States, 44% of people in households below the poverty line accessed the Internet at public libraries [1]. Contradicting common perceptions of the homeless experience, several studies have found that many (though certainly not all) homeless individuals have mobile phones that they use to connect with family, friends, and social service providers [5,6,29,45]. These studies included homeless individuals living on the streets as well as living in shelters. Eyrich-Garg's work showed that 44 of the 100 unsheltered individuals in the study had mobile phones [5]. Woelfer et al.'s work about the perceptions of safety among homeless individuals between 13-25 years old in Seattle highlighted the importance that individuals experiencing homelessness place on maintaining their mobile devices above other types of material possessions [45]. Le Dantec et al.'s work in Atlanta [27] identified mobile devices and Internet access as a basic human need among individuals experiencing homelessness on par with food and shelter.

ICTs facilitate access to online communities and support multiple forms of value expression for diverse users, including the homeless and other stakeholders in the social services sector. The Public Electronic Network (PEN), an early online community platform in the United States, was created in 1989 in Santa Monica, CA. By the mid-1990s PEN had more than 85,000 Santa Monica residents registered to it, of which at least 200 were individuals experiencing homelessness [42]. A homeless resident in PEN's online community reflected on the importance of the platform, evoking values of *equality*, *identity*, and *participation*, among others:

...No one on PEN knew that I was homeless until I told them. After I told them, I was still treated like a human being. To me, the most remarkable thing about the PEN community is that a city

councilmember and a pauper can coexist, albeit not always in perfect harmony, but on an equal basis. I have met, become friends with, or perhaps adversaries with, people I would otherwise not know of – even if I were homed. (homeless resident in Santa Monica, CA, 1996)

There has been a resurgence of web-based projects related to homelessness since those early days of the Internet when the Public Electronic Network was first formed. Examples like Invisible People (www.invisiblepeople.tv), STREATS (www.streats.tv) and Underheard in New York (www.underheardinny.com) have begun to harness the potential of social media. One project in particular stands out for its role in developing an online community of organizations, advocates, and individuals associated with homelessness. The project, called We Are Visible (www.wearevisible.com), encourages individuals experiencing or who have experienced homelessness to use Twitter to self-advocate, find social support, and help others. A Twitter user experiencing homelessness reflects on the same potential for Twitter to support individuals experiencing homelessness today as we saw in the PEN example from more than a decade before it:

Before we got involved in social media, we felt no one cared we were homeless. I got mad and went to Twitter just to vent my frustrations. We soon met people, some homeless and some not, who all seemed to have one thing in common: they did care. For the first time in months, I felt we had a voice. This was a huge boost. Through Twitter, one person set up food being delivered to us. ...we found a friend who made a flyer for us asking people if they had work, which has led to one job so far. I believe everyone can benefit from social media, and we try to help others in our area connect and have a voice too. (homeless individual on Twitter)

Through tweets (conversational statements restricted to 140 characters), Twitter users share and seek information and resources as well as express values, opinions, and beliefs about various topics [22]. Twitter works on most devices through wireless, 3G (third generation mobile telecommunications), and even SMS (short message service) technologies. This means that a user does not need to have a "smart" phone to use Twitter, but can post or connect directly with others through text-messaging on phones without data plans.

Due to its low barriers to entry, Twitter provides a space for multiple social groups to coexist, creating the potential for communities to evolve in ways that might not otherwise occur in offline contexts [31]. Zhao and Rosson [47] suggest that the informal communication that happens on a site like Twitter may increase the formation of weak ties [19] and thus the sharing and gaining of novel information especially valuable to stakeholders related to the issue of homelessness.

Values research and design to support homelessness and the social services sector

In the sections that follow, we explore how informal communication facilitated by sites like Twitter might provide a data source for values-based design work.

Although there is a large amount of research on values as a fundamental human construct in the psychology and sociology literatures, values research has not yet focused on the impact that experiences of homelessness might have on shaping personal values or making expressions of certain types of values more salient in certain contexts. Studies have shown that factors such as traumatic experiences, economic hardship, social class, and unemployment – all of which may be related to one’s circumstances of homelessness – can affect an individual’s values [7,8,9,21]. Feather [8] found that the explanations people gave for events such as poverty and unemployment could be understood as both a product of an individual’s internal value system as well as the effects of one’s larger social context channeled through family, school, or other sources of influence. Inglehart [21] found that people who suffered from economic hardship and social upheaval attributed more importance to *power* and *security* values than those who lived in relative comfort and safety.

Values also shape and are shaped by our information behaviors and technology adoption practices [14,18]. Design approaches that incorporate values promote an awareness of values throughout the technology design process for all of the stakeholders involved [13,16,17,18]. Values and design researchers have explored values to interrogate and design systems *for* and *with* individuals experiencing homelessness, and to study the role of ICTs in homelessness experiences from multiple stakeholder perspectives. For example, Le Dantec et al. [28,30] employed values in the design of a Community Resource Messenger at an emergency homeless shelter for single mothers. In their design process, they emphasized the values of stakeholder groups including homeless mothers and the social service providers at the shelter. Further, Woelfer, Hendry, and colleagues [20,44] considered the values of homeless young people and shelter staff members while a community technology center was integrated into a homeless shelter in Seattle, WA. They found that stakeholder values emerged from both life on the street and work in the technology center.

IDENTIFYING VALUES OF INTEREST TO DESIGN IN ONLINE COMMUNITIES

This paper builds on these literatures by expanding the contexts in which such value sensitive design work might be performed. For distributed, online communities qualitative in-person techniques for eliciting values like those deployed in the previously described studies provide a challenge. We have begun to experiment with additional methods to meet this challenge using content analysis

informed by social network analysis, and online surveys in the form of value portraits.

Online “values of interest” for design

Our first approach was to consider other values-rich data sources that might be available from online groups that do not require direct contact with users. Trace data from online communication provides one possible source. Schwartz’s research [35,36] shows that groups and individuals coordinate with each other in pursuit of goals that are important to them by communicating their values either implicitly or explicitly. Others have found that values expressed regularly in online communication may impact group formation, cohesion, and public perceptions of a group of people [40].

These studies suggest that examining values expressed in tweets might provide unique insights into potential values tensions and shared values; components necessary for multi-stakeholder design approaches that are sensitive to group values. These shared and/or conflicting values, which we combine under the broader concept of “values of interest”, tend to emerge among diverse groups of stakeholders during a value-centered design process [32]. They are of interest to design because they have the potential to dramatically shape or alter a multi-stakeholder design group’s practices, the resulting design products, and future use and adoption of the resulting technologies.

Shared values provide a common ground for design. Identification of shared values (e.g. *privacy* or *connectedness*) can help to initiate conversations about values in design teams, what Shilton calls “values levers” [38,39]. Conflicting values may be values for which stakeholders hold different points of view, such as *honesty* in Fleischmann and Wallace’s study [12], or values that some groups prioritize more than others, such as *wealth* and *identity* in Koepfler and Fleischmann’s study [25]. Because these values emerge from the interactions of several stakeholders, designers are often forced to tackle them as they arise, which may slow down the design process or affect group cohesion in the design team. We propose a method for identifying values of interest among multiple stakeholders prior to design to help elicit and identify potential shared and conflicting values at the start of a project.

Over the last two years, we have conducted a series of exploratory studies to elicit values of interest for design in the contexts of homelessness and Twitter. This work comes before a conceptualization for what types of new ICTs could be designed in the social services domain and helps to interrogate whether or not new tools are even necessary, which others have identified as important pre-cursors to multiple stakeholder design [43,46]. The approach that emerges from these studies considers three intersecting components: 1) the role of the stakeholders in the domain of interest (i.e. homelessness), 2) the expression of values in a

particular communication context (i.e. Twitter), and 3) the performance of stakeholder identity in both the creation of user profiles and the ongoing performance of tweeting. Figure 1 highlights the intersections among these three components. In the sections that follow, we briefly summarize each study and how it tested a method for identifying values of interest in an online context.

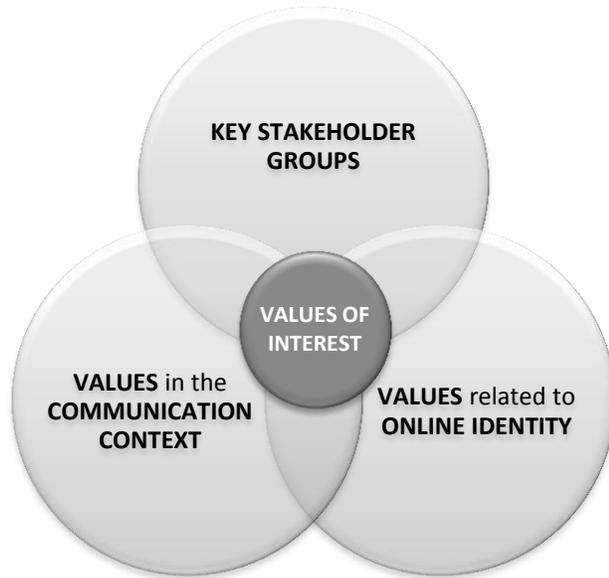


Figure 1. Intersecting components for consideration of values in multi-stakeholder design online.

Step 1: Identifying key stakeholders related to homelessness

As a first step in developing methods to elicit values of interest to design, we used content analysis and social network analysis to identify key stakeholders related to homelessness in an online Twitter network called @WeAreVisible (see www.wearevisible.com for a detailed description of this project) [26]. We analyzed the public Twitter profiles of each node in the network to determine how the individuals in the network identified themselves. We found eleven types of stakeholders: Homeless/Formerly Homeless, Homeless Advocate, Celebrity, Do-gooder, Service Provider, Non-profit Generalist, Social Media Enthusiast, Support Organization, Social Worker, Librarian, and Researcher. To determine which groups among these were *key stakeholders*, we analyzed the network structure using a clustering algorithm, which determined groups based on their underlying patterns of social ties (follower/following relationships). The analysis identified three main clusters with five key stakeholder groups: 1) a small, dense cluster of Homeless/Formerly Homeless individuals sparsely connected to a 2) second larger cluster of Support Organizations and Homeless Advocates, which were both connected to a 3) third even larger cluster comprised mainly of Social Media Enthusiasts and Do-gooders. This study tested a method for identifying key stakeholders in online communities based on the

intersection in Figure 1 between Key Stakeholders and Online Identity.

Step 2: Identifying values in the context of Twitter

Next, we used content analysis to study values in a corpus of tweets from a range of users including individuals associated with homelessness and those who had no self-identified relationship to the issue [24]. We used an inventory called the Meta-Inventory of Human Values (MIHV) [2] to guide the analysis. The MIHV is a holistic values framework that integrates and operationalizes values from twelve inventories across a variety of disciplines including psychology, sociology, anthropology, business, and design. The MIHV is comprised of sixteen high-level meta-values – *achievement, wealth, helpfulness, competence, security, identity, spirituality, broadmindedness, justice, innovation, equality, honesty, intelligence, responsibility, freedom, and social order.*

We applied the MIHV to tweets to determine if we could systematically identify all sixteen of the inventory’s values in communication as abbreviated as a 140-character tweet and to see if additional values emerged. The results showed that all of the values from the MIHV appeared in the corpus, and that two additional values emerged with equal salience – *connectedness* (referred to as belonging by [4,23,35]) and *comfort* (also referred to as a comfortable life by [34]). We referred to this new set of values as the Meta-Inventory of Human Values for Informal Communication (MIHV-IC). This study confirmed that content analysis using a values inventory can elicit values of interest in an online, informal communication context, based upon the intersection in Figure 1 between Values in the Communication Context and Key Stakeholders.

Step 3: Analyzing values and online identity

We then built upon that study and used the MIHV-IC to determine whether values in informal communication were expressed to different degrees based on online identity. We used quantitative content analysis and statistically compared values expressed in tweets from individuals who self-identified as homeless or formerly homeless in their Twitter profiles to values expressed in tweets from individuals who did not identify with homelessness in their profiles (an expanded data set from the previous study) [25]. We analyzed 5,313 tweets from 32 individuals and found significant differences between the two groups for *wealth, helpfulness, identity, spirituality, broadmindedness, justice, equality, responsibility, and freedom.* In every case, tweets from the homeless or formerly homeless individuals expressed these values more often than the tweets from the comparison group. This study confirmed that the MIHV-IC could identify differences between values among stakeholder groups, illuminating the intersection between Values related to Online Identity and Values in the Communication Context in Figure 1.

DEVELOPING A UNIFIED METHOD

The intersecting components of Figure 1 were confirmed by each empirical study, demonstrating a three-step process to identify stakeholders online, elicit values, and compare values differences and similarities between stakeholder groups. However, the content-based methods used in the previous studies are quite resource-intensive and may not scale for researchers or designers seeking to do quick front-end values research prior to the start of a design project. In the following sections, we describe a unified approach for understanding the intersection of values of stakeholders, communication context, and online identity using contextualized value portraits disseminated in a web-based survey. Other scalable methods that may be explored in the future include automated content analysis using machine learning techniques and additional approaches that use social network analysis techniques.

Developing and deploying an online values survey

As a first step towards creating a diagnostic tool for values elicitation useful in front-end design research, we developed and deployed a set of contextualized value portraits as part of a larger web-based questionnaire hosted on SurveyGizmo (www.surveygizmo.com).

Contextualized value portraits

We created the contextualized value portraits by modeling Schwartz's Portrait Values Questionnaire (PVQ) [36]. The PVQ is a survey instrument that assesses people's value priorities using short verbal portraits. Each portrait describes a person's goals, aspirations, or wishes, which point to specific values. The PVQ is deployed annually in the European Social Survey (<http://www.europeansocialsurvey.org/>) and its underlying theoretical framework was detected in samples across 67 nations.

We adapted this approach by basing the language in the portraits on examples found in the datasets from Studies 2 and 3. We developed portraits that would reflect the overlapping nature of online identity with online communication contexts by adding language to contextualize each portrait (Schwartz's original portraits are context-neutral). Table 1 lists the portraits for each value, which were randomly presented to participants on one page of the survey. Schwartz's PVQ typically uses two value portraits for each value under investigation, but due to space limitations within the larger survey, we were limited to just one portrait per value.

Before responding to the portraits, we asked survey participants to indicate their gender identity so that the portrait items displayed would include appropriate gender pronouns, modeled after Schwartz's approach. For each portrait, a respondent determined how much s/he was or was not similar to the person described by the portrait on a scale from 1-6, where 1 = not like me at all and 6 = very much like me. The respondents were asked to compare the portrait to themselves (i.e. "Please read each description

and think about how much each person is or is not like you.") to encourage a focus on the value-relevant aspects of the task [36].

[Value] Portrait
[Connectedness] It is important to her to stay in touch with her friends and family online. She tries to make and maintain new friendships through Twitter.
[Comfort] It is important to her to live in a comfortable environment. She acknowledges both positive and negative experiences in her environment through Twitter.
[Wealth] It is important to her to have money and nice things. She promotes her work through Twitter to make money or gain resources.
[Equality] It is important to her that everyone be treated equally. She wants justice for everybody, even for people she doesn't know on Twitter.
[Broadmindedness] It is important to her to follow people on Twitter who are different from her. Even when she disagrees with them, she still wants to see different points of view from their tweets.
[Helpfulness] It is important to her to help people who seek information and resources on Twitter. She wants to help others find what they need.
[Identity] It is important to her to be open and honest about her identity on Twitter. She understands who she is and how she is perceived by others.
[Spirituality] It is important to her to express her religious or spiritual beliefs on Twitter. She is comfortable using religious language in her tweets.

Table 2. Contextualized value portraits.

Sample

We used an integrated sampling strategy, combining purposive and viral sampling approaches [33] to recruit participants for the study. We use the term *viral* as opposed to snowball, chain, or reputational sampling to describe more accurately the ways in which the survey could spread through online informal communication on Twitter. For example, in each recruitment tweet, we included a request for individuals to re-tweet the message to their own networks and used a variety of hashtags (e.g. #homeless, #socialissues). We used this approach to gather individuals outside of our personal networks and to target Twitter users who might have a stake in the issue of homelessness. We sent a total of 150 direct messages and 145 at-mentions during the recruitment period. As an incentive, we offered participants one of twenty-five, \$5.00 Amazon.com gift cards in a randomized drawing to complete the survey.

Due to the sampling approaches, an exact response rate was difficult to calculate. We used bitly (www.bitly.com), a URL shortener and redirection service that provides tracking to serve as a proxy for response rate. Bitly counts the number of clicks a link receives and ignores clicks from

spambots and crawlers. It does not account for multiple clicks by the same user, however. During the study period, the survey link received 580 clicks. After clicking on the link, a summary page appeared with information including purpose of the study for research, anticipated time required to take the survey, details about the incentive, and other logistical information. A consent form appeared on the next screen for participants who chose to proceed from that point. Individuals indicated their consent to participate in the study by clicking “I agree” at the bottom of the page and proceeding to the beginning of the survey. From the consent form, 199 participants completed all or part of the survey (34% estimated response rate).

This paper considers a subsample of respondents who indicated in the survey that they used Twitter and then completed the contextualized value portraits and subsequent demographic questions (n=132). The survey also asked additional questions related to values, social media use, and Twitter access and behaviors, which were not included for analysis in this paper.

The average age of respondents in the subsample was 34 years (SD=9, min=19, max=64). The majority of participants were female (68%, n=90), European American/white (78%, n=103), and well educated (graduate degree or higher: 55%, n=72; 4-year college degree: 30%, n=39). Demographic information was not available for non-responders; therefore, it is not known whether a self-selection bias exists regarding survey participation. When compared to the demographics of Twitter users more generally [41], this sample appears to be representative with regard to age and education level, but is skewed slightly in terms of gender (more females) and ethnicity (fewer Hispanics and African Americans).

Stakeholder groups

After completing the values portraits, participants responded to a series of questions about their associations with homelessness, approximating the groupings of key stakeholders that emerged in Study 1. Participants indicated whether they had worked for, volunteered for, and/or donated money or goods to an organization associated with issues of homelessness and poverty within the last twelve months. They then indicated whether or not they had experienced homelessness in their lifetime and were asked follow-up questions about the recentness and frequency of that experience.

RESULTS

Defining Stakeholder Associations

Table 2 presents the distribution of each stakeholder association and a detailed description of the survey respondents who indicated that they had experienced homelessness. It is interesting to note that more than half of the participants who had experienced homelessness indicated that they experienced it more than once (57%, n=12), and had experienced it since the 2008 economic

crisis, which is in line with recent reports on the current state of homelessness in the United States [37].

Characteristic	% (n)
<i>Stakeholder associations</i>	
Donated goods to a social service organization	80% (106)
Donated money to a social service organization	41% (54)
Volunteered for a social service organization	30% (39)
Experienced homelessness	15% (21)
Worked for a social service organization	11% (15)
No stakeholder relationship to homelessness	11% (15)
Missing data	5% (6)
<i>Most recent experience with homelessness</i>	
Currently homeless	10% (2)
Since the 2008 economic crisis (2008-2011)	43% (9)
Prior to the 2008 economic crisis (1995-2007)	20% (4)
Before 1995	10% (2)
Prefer not to answer	10% (2)
Missing data	10% (2)

Table 2. Summary statistics of stakeholder associations.
Note. Columns total greater than 100% due to multiple responses and/or rounding error.

We also note that these groups are not mutually exclusive, which is why we refer to them as stakeholder associations – people may associate with the issue in more than one way. For example, of the individuals who reported working for an organization related to homelessness or poverty in the last year, six had experienced homelessness at some point in their lives. Thirteen of the people who had volunteered for such an organization in the last year had experienced homelessness. The same was true for people who indicated that they had donated goods (19 people indicated also experiencing homelessness) and people who indicated that they had donated money (14 people had experienced homelessness). Survey participants had anywhere from zero to five associations with the issue of homelessness with an average close to two ($M=1.87$, $SD=1.26$).

Hypotheses

Although the overlap between the stakeholder associations limited the statistical tests that could be conducted, it provided a rich picture of stakeholder relationships to homelessness than would have been possible if we had asked participants to try to identify only one stakeholder group. We conducted one-tailed point-biserial correlations to determine relationships between the values portraits (which combined online identity and the communication context) and the stakeholder characteristics. A point-biserial correlation is a nonparametric statistic that identifies relationships between a discrete-dichotomous variable (i.e. yes or no responses to the stakeholder association questions) and a rank-order variable (i.e. the scale used in the portraits) [3].

Specifically, we tested the following hypotheses developed during the three exploratory studies:

1. There will be values that show positive relationships across stakeholder associations, indicating shared values of interest for design.
2. There will be values that show positive relationships to some stakeholder associations but not others, indicating potentially conflicting values of interest for design.

Due to the number of statistical tests required to test these hypotheses which may increase Type I errors across the study, we selected a more conservative alpha level ($\alpha=.01$) to determine statistical significance. In order to maintain comparisons between prior studies and this one, we also report findings at $\alpha=.05$, but note that these findings are less robust.

Values of Interest

Overall, the strength of the correlations were small, but they were in the anticipated direction (i.e. positive) and pointed to several values of interest. Six values (*connectedness*, *wealth*, *identity*, *spirituality*, *broadmindedness*, and *equality*) showed significant positive correlations ($p<.01$) with at least one of the stakeholder associations.

Shared values

Broadmindedness had statistically significant positive correlations with two stakeholder associations, individuals who indicated that they had volunteered ($r=0.28$, $p<.01$) and individuals who worked for an organization associated with homelessness or poverty ($r=0.28$, $p<.01$) in the last twelve months, and showed positive trends for the other three groups (donated goods: $r=0.15$, $p<.05$; donated money: $r=.021$, $p<.05$; and experienced homelessness: $r=0.21$, $p<.05$). The fact that at least some positive relationship emerged among all five associations highlights *broadmindedness* as a potential shared value among stakeholders associated with homelessness (hypothesis 1).

Conflicting values

Wealth and *equality* were positively associated with those who had experienced homelessness ($r=0.31$ and $r=0.21$ respectively at $p<.01$), but no other groups. *Identity* and *connectedness* were associated with those who had donated money to an organization ($r=0.23$ and $r=0.21$ respectively at $p<.01$), but no other groups, pointing to potential conflicting values (hypothesis 2).

Spirituality was positively associated with those who had experienced homelessness ($r=0.28$, $p<.01$), and showed positive trends for individuals who had donated money ($r=0.19$, $p<.05$) and volunteered for an organization ($r=0.19$, $p<.05$). It is not clear whether this would be a shared value among group members or a conflicting value.

The findings from these correlation analyses provide preliminary empirical evidence that survey methods can capture all three critical parts of a values-elicitation process: key stakeholder groups, an online context, and the

relationship of values among these groups. This particular study suggested six values of interest, one which was identified as a shared value, four which were identified as conflicting values, and one which was unclear. These values might be considered in a future value-sensitive design process for online communication tools for these stakeholders.

USING THE METHODS

Prior to a design activity, it is useful to explore how stakeholder relationships might influence the salience of particular values in a design project. Previous research in the social services domain has used qualitative approaches tailored to specific stakeholder groups to accomplish this goal, but these approaches may be difficult to scale up or to replicate in other environments. The contextualized value portraits presented in this paper offer a starting point for engaging values *a priori* the design of large-scale or distributed ICTs. An example of such a system might be deploying the Community Resource Messenger, developed by Le Dantec and colleagues [28,30], at a larger scale by implementing it in shelters across the state of Georgia. Another example could be developing a tool that aggregates real-time updates through tweets regarding social services and other information and resources. As government funding becomes increasingly scarce, such approaches may become more desirable for effectively allocating resources and facilitating communication and information exchange among stakeholders in this domain. Ensuring that the values of interest of the key stakeholders involved are addressed at the outset will facilitate the success of such systems and design teams.

Though the specific values of interest identified by the survey performed here are limited to the study sample and are not generalizable to a broader population, we can consider how they might impact real design scenarios. For example, *broadmindedness* emerged as a shared value among stakeholders associated with homelessness. Knowing that this is a potential shared value ahead of time enables designers to proactively use this value as a “lever” to “pry open” discussions about values during the design process [38,39]. Team leaders can explicitly state that this value is core to the group’s interactions and success and initiate *broadmindedness* as a design requirement in the system or as a shared value for inter-group communication during design meetings.

Additionally, awareness of conflicting values is also useful. Value conflicts are a natural part of the design process yet they can have major impacts on the resulting design of systems [12]. Conflicts may arise around competing values or they may arise when different stakeholders prioritize values that are less relevant to other stakeholders, such as *wealth*, *equality*, *identity*, and *connectedness*. Team leaders could guide the design team through exercises that raise these issues at the start of a design project in order to get potential conflicts out in the open and leverage those

discussions for innovations in the design of the system. In this way, the contextualized value portraits along with the framework for identifying values of interest become precursors to using other design tools, such as Envisioning Cards (<http://www.envisioningcards.com/>), which intend to raise awareness of long-term and systemic ethical issues and values in design [15]. Identifying values of interest allows designers to select appropriate envisioning cards for the design team and the intended design product.

Finally, values of interest can also help team leaders bring together their design teams. Creating diversity in design teams is often based on demographic characteristics, but determining values of interest can help team leaders recruit individuals with a diversity of values, or, conversely, ensure that the design partners they select all have at least one common value among them.

LIMITATIONS & FUTURE WORK

There are several limitations of this study that could be addressed through future research. First, a significant limitation is that we used only single-item portraits to measure each value in order to keep the length of the survey to a minimum. This decision sacrificed construct validity for increased response rate and survey completion. Future work should consider developing 2-3 contextualized value portraits for each value under investigation. Further, we contextualized the portraits within the context of Twitter and just one of an individual's potential online identities. This is a limitation of the idea of using value portraits; a portrait assumes a single, unitary identity for a respondent. One survey participant highlighted this issue in the open comments section of the questionnaire:

I actively use Twitter from multiple accounts, for multiple purposes (I have an academic account and a sports account...). My answers hold true for both, but you may want to consider how to address users with multiple accounts.

In addition to multiple accounts within the medium, Twitter allows users to move fluidly between communication contexts. Further research is needed to examine the role that multiple user accounts, multiple social media identities, and context-switching between communication tools (i.e. from Twitter to Facebook and back again) has on the user experience and the elicitation of user values. Additional research in other informal communication contexts, including Facebook, Tumblr, and personal blogs, could be used to further vet the methods proposed in this paper.

Second, the stakeholder groups used in the survey deployment were relatively small and skewed due to the sampling procedures necessary for data collection. The distribution of individuals who did and did not have certain stakeholder associations ("yes" responses versus "no" responses in each category) were unequal. As dichotomous distributions become more unequal they constrain the potential strength of statistical correlations that one can find

with the dependent variable. Larger samples from individuals with the characteristics of interest would support more robust statistical analyses, such as exploratory factor analysis, to determine which of the variables associated with homelessness or one's online identity account for the greatest amount of variance. Findings from such studies would contribute to validating existing components of the framework and potentially adding new elements for consideration.

Lastly, values are incredibly complex and difficult to study, as is the issue of homelessness. The contextualized value portraits showed the relationships between values and different stakeholder associations to homelessness, which could not be identified through methods like content analysis. This finding highlights the importance of mixed-methods research for the study of values more generally. Triangulating the methods explored here and combining them with qualitative studies could shed light on the many factors that co-occur in these contexts.

CONCLUSION

This paper built on iterative studies of values in informal communications contexts to develop and deploy a set of value statements, called contextualized value portraits, to identify values of interest to design within online communities. The aim of the methods developed here are to provide an approach to considering the role of human values among groups who may only connect online, due to geographic or other normative constraints, as a precursor to the value-sensitive design of technologies that support marginalized communities. Deployment of a set of contextualized value portraits and follow-up questions using a web-based questionnaire disseminated through Twitter (n=132) showed significant relationships between all stakeholders and the value of *broadmindedness*, indicating a potential shared values of interest. Potentially conflicting values of interest included *wealth* and *equality* (associated with those who had experienced homelessness), and *identity* and *connectedness* (associated with those who had donated money to an organization related to homelessness in the last twelve months). *Spirituality* showed a mix of associations and further research is necessary to determine what that mix of associations might mean in terms of shared and conflicting values.

The findings offered several implications for considering values in online communities as a first step in the design of ICTs. The importance of designing systems in this way can perhaps best be summarized by revisiting the PEN project and the homeless resident who explained [42]:

On PEN, I have been helped, rebuffed, scorned, criticized, considered, and in most cases, respected – as a human. PEN is a great equalizer. There are no homeless or homed unless we say we are. We are not one happy family; like most families, we squabble. On any topic, no one can accuse PENners of agreeing fully. But we are

communicating, and that is a start. (homeless resident in Santa Monica, CA, 1996)

From this perspective, being present at the stakeholder table and opening up the lines of communication, regardless of whether values conflict, is what matters most.

ACKNOWLEDGEMENTS

[This section is currently left blank to preserve anonymity required for the blind peer review process]

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