Scenario Co-Creation Cards: A Culturally Sensitive Tool for Eliciting Values

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ABSTRACT
Values are an integral part of human identity and have a pervasive impact upon human behavior. This makes understanding them a central concern in the design of technology, as exemplified by approaches such as Value Sensitive Design ("VSD"). Identifying and concreting the values held by a given population can be a difficult endeavor, especially where there is a cultural barrier limiting an effective discussion of them, for example in societies where freedom of expression is discouraged. Addressing this concern requires an in-depth consideration of appropriate value elicitation methods, which responds to the fact that it is not possible to understand values detached from their cultural context. We introduce a novel implicit method, Scenario Co-Creation Cards, and show how it can be used to incorporate existing models of culture in the value elicitation process. We demonstrate this in a case study of Saudi women's visibility in the digital media.

Author Keywords
Values; value elicitation; VSD; scenarios; cards; user research; method; Saudi Arabia.

CCS Concepts
• **Human-centered computing → Human computer interaction (HCI);** HCI design and evaluation methods.

INTRODUCTION
Designing for any population requires beginning with a deep understanding of users and their needs [60]. This requires selecting an adequate research approach tailored for the research question and the goal of the study [65]. This is a particularly vital decision to make when researchers attempt to adopt value sensitive or culturally sensitive approaches. Value Sensitive Design (VSD) [24] and other value-centered methods [40,41] have been developed to help ensure technology designs are congruent with the values of those (stakeholders) who directly or indirectly interact with systems [24]. Eliciting values is a fundamental aspect of VSD: it is not possible to effectively perform VSD without

having a sufficiently concrete understanding of what the underlying values of a target population actually are [10]. However, determining relevant values, and how they operate, is a challenging endeavor. In certain cases, this may be achieved simply by asking those concerned, however, this depends on the values, the person, and the cultural context. Yet in some cases, people may not know what their values are [33], whilst self-reported values raise questions of efficacy [35], and values are typically expressed as protean words, making their direct discussion and documentation challenging [28].

The 'third wave' of HCI emphasizes the importance of incorporating human elements - including culture - into the design process [9]. Despite acknowledging the influence of cultures upon the way people interact with technology, there is still a lack of practical guidance on how to explicitly integrate this concept in the design process [57]. An exception is a framework known as the Value Oriented and Culturally Informed Approach (VCIA) [57]. Yet, in addition to its complexity, the VCIA is a designer-generated framework and does not provide concrete methods to elicit values. We address this gap through the development of a novel culturally sensitive method, which is designed to *elicit* values from people who may be in a power relationship that hinders in directly discussing implicit values. We make three specific contributions: (1) we offer a principled approach (or method) based on the available literature for the problem in question (which has only been indirectly addressed in the VSD literature); (2) we evaluate this method and thus provide an exposition of its operation; and (3) we provide wider indications about how it operated to enable future investigations to be conducted more effectively.

BACKGROUND

A. What Are Values?
Values are an important and central concept in many fields [64]. However, the concept of a value is not entirely well-defined, and this issue has vexed philosophers, scholars and lawyers alike [22,34,45]. Nevertheless, values have core characteristics that help explain what they are and how they might be utilized as tools to assist in designing systems in an inclusive manner. Specifically, values have been described in this literature are as follows: *(1)* values represent what is important and worthy [22,34,64] and not what is 'right or wrong', (in contrast to other concepts like ethics and norms [14]); *(2)* values are internal principles based in the *'forum*

internum' of a person: they are part of how people think and therefore do not have a freestanding existence outside of the people who hold them [14,35,45,64]; *(3)* values are motivational in nature [22,51]: they act as psychological drivers for individual decision making; *(4)* values are evaluative/normative principles to direct the choice between alternatives [34,35,45,64]; they are not simply evaluated on an emotional level, but assist in rationalizing decisions that people make; *(5)* values are relatively stable and change slowly within an individual [22,34]; and *(6)* values are said to be trans-situational (i.e. consistent across situations) [51]. Overall, there is a cumulative picture from these characteristics based on which we define values as being: *'a fundamental and internal guiding mechanism which serve as an evaluative dimension of human choices and influence behavior across a diversity of situations and circumstances.* The implication of this is that measurement of individuals' judgments, attitudes (evaluation), beliefs (perceptions about what is true), traits (consistent patterns of thoughts and actions) and adherence to norms (social rules) are potential means for indicating values that they hold [34,45]. These are key concepts to understand how people express values.

B. How do people express and manifest values?
To deal with values in design, one first has to work out what they are, as held by a target population. Naturally, this is not easy, for a multiplicity of reasons. The articulation of values can be challenging as they are abstract and unobservable [33,34,45]. Whilst values are often offered and thus typically measured in self-reported forms [35], the difficulty can be that the manifestation of the same value takes markedly different forms, and furthermore people may not actually know what their values are [33]. There is also the possibility (as will be illustrated later in this paper) that *how* someone expresses themselves can be a value in of itself (e.g. collectivist vs individualist societies). Moreover, values are often expressed as protean words, making their direct discussion and documentation challenging [28]. This is more complex in other cases for people with certain cognitive impairments, those subject to social exclusion, or those from very different cultural backgrounds to an investigator [6].

All of this presents an interesting challenge: what is a fair way to identify and measure values so that we can take an appropriate account of them in design decisions and properly balance '*tension*' [50] between them in a design process? In practice, the solution has been to analyze *how individuals make choices*, indeed, Hills [34] suggests that this is the only practical approach. This allows values to contextually emerge in relation to other values, thus enabling the values and the tensions between them to be identified. The next question is: what choices should be given to subjects so that their values can be identified? There is no universally applicable answer, but approaches (or elements thereof) generally follow one or more of four *principles*: *(i)* making a choice from a (real) selection (which includes the classical 'stated preference' techniques and contingent valuation [49]); *(ii)* justifying a choice from a real selection [21]; *(iii)*

justifying a choice from a hypothetical scenario (including a future scenario) so as to abstract away from prevailing social norms and constraints [21]); and *(iv)* comparing across scenarios, or cross-situation scalability (which is necessary to avoid a consideration of single situation only, as this might not be reliable [34]). These principles can thereby inform the design of a value elicitation method.

C. VSD and the Value Elicitation Challenge
VSD is a framework, not a method, and it is not overtly prescriptive with respect to how values should be identified [47]. A starting point for VSD investigations has been the use of universal values of moral import [10]. The application of these values has been criticized: most notably in the work of Borning and Muller [10], which decried the emphasis upon *"universal"* as opposed *"culturally specific"* values. Muller [53], stated that *"the problem is the undifferentiated mixture of the researchers' values and the described values of other people."* The overall point is that there is a need to accurately identify the values of those who use a system, rather than applying 'westernized' values to other cultures. Likewise, Le Dantec *et. al.* [47] stated that *"what is needed is more prescription in methods that inform value-centered research, and less prescription in the kinds of values".*

To address this, 'value elicitation methods' have emerged in VSD to identify different values of given populations [79]. There is no universally agreed upon approach towards doing this, however, most approaches are qualitative in nature [68]. These include ethnography, interviews, surveys, and design exercises [67]. VSD researchers sometimes find themselves facing a challenge of identifying a suitable method for certain projects, which led to adapting existing methods or even inventing new methods. [27]. Some studies have used novel techniques such as those presented in Friedman and Hendry's review of 17 VSD methods [27], six of which were classified as value elicitation methods. We explain what these are below and why they are not suitable for a scenario where there are strong cultural barriers preventing the effective expression of values.

(i) Value-oriented semi-structured interviews
Semi-structured interviews [23] are the predominant method used in VSD. These interviews tap into participants views and values about technology, evaluative judgements and reason [27]. In VSD, the substantive content of the semi-structured interviews is designed specifically for eliciting values. The potential advantage of this approach include pursuing topics in depth and engaging new considerations provided by stakeholders into the discussion [26]. However, simply asking people as to their values, without more, is unlikely to work in a scenario where they are culturally dissuaded from articulating them.

(ii) Value scenarios
This is a technique that uses pastiche vignettes to help envisioning the systemic effect of proposed technologies [16,55]. The generation of value scenarios has been used by designers as an analytic tool (as in [16]); and in other cases

[80] by stakeholders as an empirical tool to elicit stories (as in [77]). The difficulty with this approach is that the scenarios already pre-suppose values and thus it has so far been used to qualify, as opposed elicit, values of participants.

(iii) Value sketches
Sketching has been widely used with participants in HCI [13,71,73]. In VSD, value sketching uses sketches made by participants to tap into their non-verbal views and values, particularly in relation to technology and how it is situated in place [27]. This method has been used in both digital concepts (as in [29]); and in physical locations (as in [77]). The main advantages of this technique are provoking participants and allowing non-verbal expressions quickly and cost-effectively [15,26,72]. This is especially the case when participants possess good visual intuition (as in [15]). However, not all participants are confident expressing their thoughts by drawing or sketching [73]. This may end up creating a narrow context for discussion, limiting the outcomes of the 'elicitation' to only *sketchable* concepts and ideas. Unfortunately, value sketches have often placed an emphasis upon understanding user conceptions of *existing* (or pre-identified) values as opposed to genuinely eliciting them from the beginning [29], making this approach effectively biased.

(iv) Value-oriented mock-ups
This method involves developing a mock-up of an artefact or object for *'scaffolding'* the investigation of values [26]. Examples include mock-ups of cardiac devices [17], a hypothetical mobile application [16,26] and video prototypes [76]. These methods have the advantage of being concrete: in effect, they are more detailed and fleshed out value scenarios, amounting to their more concrete and tangible alternative. Yet, this technique is constrained to substantial artefacts, or spaces of artefacts and works for refining solutions, thus can not to be applied in the earlier stages of the design before any potential solutions are being discussed. In other words, it is appropriate for refining, as opposed identifying, the values of participants.

(v) Scalable information dimensions
This technique uses a set of questions to tease out scalable dimensions such as pervasiveness, proximity and the granularity of information [27]. Scalable information dimensions address the problem of granularity with respect to continuous variables: for example, with respect to privacy, someone might be happy with friends knowing what town they live in, but not which street. This approach is not prescriptive with respect to formats and in practice, it can be combined easily with other methods [26]. However, the focus here seems to be on the gradation within the questions asked to elicit values, rather than going beyond that notional 'box' or facilitating participants value expression. In effect, it is an approach for qualifying, as opposed identifying individual values.

(vi) Value sensitive Action-Reflection model
This model involves a reflective and interactive process in which designers or stakeholders generate value sensitive prompts [27]. The Action-Reflection model is associated with co-design, and encourages stakeholders in such settings to be both reflective and to generate new ideas that would be otherwise challenging regarding co-design activities [26,63]. For example, in [80], a combination of stakeholder and designer prompts were used in *"a co-design process with homeless young people, service providers, and police officers"*. In practice, this approach provides participants a clear opportunity to reconsider their designs from a value perspective [27]. However, as with value sketches, this method is oriented toward ideation of designing new solutions and iteration of that design, as opposed genuinely eliciting values.

D. What Is Missing? – Culture and Values
Value elicitation methods in the VSD literature have been reported to be effective in the circumstances where they were deployed, and have helped designers focus on the critical elements of the design situation [27]. However, a number of gaps are apparent, including: *(i)* there is no clear criteria or systematic reflection on what makes a method classified as a *value elicitation method*; and *(ii)* in general, value sensitive methods are not developed for culturally specific groups of users. Surprisingly, this is true of cases even where VSD has been applied in cross-cultural studies (as in [2,6]) where the cultural focus was on the understanding of the culture. In general, the design of value-sensitive methods has hitherto been unprincipled.

The fact that values are inherently cultural is an important concern to address if value-driven approaches are to be genuinely inclusive of all cultures, and with that, the technologies that end up being designed and deployed into a wider society. One difficulty is that values are culturally specific, and often do not translate directly from one setting to another [28]. This is particularly challenging for populations coming from a socially and politically conservative culture [42], as in (for example) Saudi Arabia, which has a deeply conservative culture defined by patriarchal structure [31] and a collectivist society [37], where individualism and freedom of expression are not promoted, and where there is limited historical knowledge about the population [5] to draw upon. These difficulties are perhaps why VSD and other approaches have imported, on occasions, a closed set of westernized values and then used them in the design process as a check-list, even where they are inappropriate [53].

Value Sensitive Design has been predominantly been used in Western contexts, and is increasingly being applied in a variety of domains from health informatics to responsible innovation [27]. Many VSD studies report employing qualitative methods including as semi-structured interviews [6], in-depth interviews [4] and conversational interviews [2]. However, it is particularly notable how researchers

justify using different techniques to account for the cultural norms of their participants. For instance, Alsheikh *et. al.* [6] chose audio-only calls in their semi-structured interviews (intentionally) to *"diminish cultural hesitation and embarrassment".* Abokhudair and Vieweg [2] allowed their Arab participants to use their second language (English) in interviews to facilitate their expression *"when discussing sensitive topics ... participants tended towards English".* In another study, Abokhudair *et. al.* [1] reported that having both an *insider* researcher and an *outsider* researcher furnished them a *double advantage*: while the insider had "*insights into the nuances and complexity of the cultural practices*", the outsider was found to be easier for participants to "*open up*" to as they freely discussed their *"secret boyfriends/girlfriends, alcohol consumption, getting tattoos, and additional haram or taboo activities*". This was attributed to "*participants' lack of fear of judgment*". These reported techniques, whether designed intentionally or not, lend weight to the argument that cultural sensitivity is key to the efficacy of a value elicitation method, in that it gives rise to findings that would have been difficult to obtain otherwise.

As such, a careful and intentional (re)design of methods is imperative to use for research with culturally specific groups. In response we developed *Scenario Co-Creation Cards* building upon VSD methods and inspired by existing literature on value expression. This method seeks to account for cultural factors in its design and operation.

BEING PRINCIPLED ABOUT VALUE ELICITIATION: DEVELOPING SCENARIO CO-CREATION CARDS

We describe three aspects of the design of the *Scenario Co-creation Cards*: the conceptual design, the physical design and the practical design, which correspond to individual steps for implementing our approach. We also explain how these cards are to be embedded into a semi-structured interview and the full process for implementing our method.

Conceptual Design: The Content

The first step is to develop the core content of the card decks, namely the broad-brush category for each pile of cards. By way of an example, our research question was: *how might we support Saudi women's self-disclosure in the digital media (with minimum violation of their cultural values)?* From this question we identify self-disclosure as the phenomenon, and in disassembling the question we identified three concepts (dimensions): the user (Saudi women), the technology (digital media) and the obstacle (culture). In practice, one is not normally starting with a blank canvas, but with other background knowledge, which can be used to refine the qualities of each deck. (For our case, we were guided by the cultural study of Alshehri et. al. [7] (which studied this population) in grounding the content of the cards in an accurate cultural understanding, which describes Saudi culture as being split between values and *stakeholders*.) This led us to represent the 'culture' dimension in the form of different stakeholders in our cards (i.e. audience). Hence, our

three dimensions for our cards deck are: user, media and stakeholders.

Physical Design: Designing the Individual Cards

The next step is to design the individual cards. Each deck of cards depicts the identified dimensions using a set of images selected based on the cultural understanding of the context (as already known): each card contains one image. We deliberately use pictures rather than text: picture cards have a long history as being a tool for assisting participants to express themselves. The visual and tangible nature of cards provides a sensory stimuli for communication [32], thereby facilitating dialogue by making abstract arguments tangible and visible [39,62]. Picture cards also encourage non-linear progression and enable participants to make tangible discussion by spreading out the cards to make comparison and connections between different concepts [79].

In choosing (or generating) an image, there were three principles we adopted: *(i)* the provision of a wide range of possibilities within each deck; *(ii)* the need for flexibility in the images selected for each card (ideal images should allow for a degree of abstraction); and *(iii)* that already known cultural concerns (e.g. not using a picture of a deity, as in our case) are respected. Recognizing that images can provoke emotions, and that our goal is to minimize leading interpretations, we sought to select images with minimal context (i.e. that no story could be construed from a single image). This is distinctive from Friedman and Hendry's work on the envisioning cards [25], which *"paradoxically, ...become a case in which values are instantiated in a design – i.e., the design of the cards themselves"*[53]: thus amounting to an examination values and systems that had already been chosen (by the researchers) and **not** to actually facilitate value expression (where as our work seeks to do the opposite and enable participants to express *their* own values).

Figure 1: The Scenario Co-Creation Cards Deck
(Left to right: green cards for stakeholders, blue cards for media, and red cards for role.)

At first sight the pictures of our deck might seem obvious, but the interpretations can yield rather different contexts. For example, a woman wearing a white coat (one of our picture cards) could be interpreted as a medical student, a nurse, a doctor or a scientist (as later shown in the findings). Asides from one stakeholder card, which has the text 'Allah' due to cultural sensitivity in depicting 'God' (or any other deity), all the other cards are purely pictorial in nature, which helps to

create a degree of abstraction (and thus further flexibility). This is in addition to addressing the fact that the use of words, especially the protean words that might be used to describe values, run the risk of talking cross-purposes. Each deck of cards had a colored reverse side (i.e. red, green, or blue), which enabled a scenario to be drawn at random by the researcher.

The Practical Design: The Co-Creation of Scenarios within Semi-Structured Interviews
The final step is to put the cards into practice within a semi-structured interview. Within an interview, a scenario (and thus a line of questioning) is generated as follows. A complete scenario arises from the composition of three images, coming from three decks (one from each deck), which participants are asked to verbally describe (and interpret). Our participants are thus asked to draw a card from each pile while providing a brief description of what each card could mean. They would then compose these descriptions into a scenario and project upon (the scenario) how and why they would act/react in a specific way. The researcher will then summarise the participants position to confirm that what they have said has been fully understood. The researcher then further probes the participant to elaborate on their response as appropriate, developing their questioning based on the substantive content of the cards (and relevant contextual information). Once a clear interpretation and justification is provided for a specific scenario, the researcher asks the participant to change the cards, either fully (the three cards) or drawing one or two from the piles depending on the conversation and the participant's description of the scenario. Within an interview, we would expect to explore around 10-20 scenarios, with discussions lasting around 3-10 minutes, but with some discussions being longer or shorter than others. It was more common to change one card at a time (this happened 70% of time in our case), as opposed create a fresh scenario from multiple cards.

As is apparent from the above, our approach operates as an expansion to the (semi-structured) qualitative interview. This builds upon the advantages qualitative interviews have, including that they are already widely used to understand the lived experience of interviewees and how they make sense of their own experiences [52,65]. What's more, value elicitation methods have been integrated with interviews, but with additional affordances, such as using card based tools [78] and photo elicitation interviews (PEI) [20]. Naturally, putting this into practice requires the usual preparation of a semi-structured interview for culturally sensitive settings: for example, the need to carefully research the backgrounds of participants. To put it another way, it is widely recognized as being ethically imperative for those working with indigenous populations to be 'culturally competent' [75] (an analogous concern to what we have): which can only be achieved by understanding the unique combination of culture, religion and politics shaping cultural and individual values [74]. However, this does not mean the researcher needs to be of the same culture as their subjects, merely that they properly understand it.

However, there is one aspect where our approach is fundamentally distinctive: namely the *emphasis upon a combination of using scenarios and enabling their co-creation from the aforementioned picture cards*. There are multiple advantages to using scenarios. First, scenarios provide an open hypothetical and contextual basis for discussions [18,30]. Second, the hypothetical nature of scenarios allows for bypassing socio-cultural structures and thus encourages free expression both on existing practices, or exploring the future [18,39]. Third, the use of scenarios placed on picture cards is an example of using projective techniques: these operate by 'projecting' a participants subjective experience onto an external stimulus [8,38,58], typically some kind of physical artefact, such as a collage [46], metaphorical cards (as with our work) [44], or by engaging in painting and/or photography [59]. Projective techniques are a long-standing approach towards addressing participant's inhibitions in discussing sensitive topics [38,44,46]. Projective techniques have a range of advantages that make them particularly suitable for difficult discussions, be it through building rapport [19,58,70], their lack of intrusion [58], their ability to access hidden content [46,58,59], or their ability to depersonalize participants' responses and thus enable them to 'save face' [46].

Moreover, the specific process for generating scenarios from cards is deliberately configured as a *co-creation* process. A co-creation process is designed to facilitate a dialogue and discussion wherein a participant has genuine influence over where the discussion travels. There are reasons why this would be effective: studies have shown that *(i)* enabling participants to create their own props increases their engagement in discussions [11], *(ii)* the use of artifacts helps free people to envision alternative ideas from their pre-conceived ones without decoupling them from their reality [48] and *(iii)* using generative tools encourages participants to express a wide range of unique emotions and experiences [62]. It can thus be expected that co-creation will enable a participant to justify a choice in real or hypothetical circumstances. We achieve co-creation primarily through flexibility. This flexibility is necessary to ensure that this is a genuine co-creation process, as opposed being an a mere mummery where the researchers' values are rearticulated by the participants, a well-known risk in VSD [3,53]. This is achieved through the design of the cards: the use of three piles (dimensions) means a large number of permutations (which for our deck was 16 in each category, amounting to $16^3 = 4096$ different card combinations). In turn, this affords a great degree of flexibility, especially when it is observed that each card (and thus card combination) can be subject to a variety of different interpretations.

CASE STUDY
We present a case study of Saudi women's visibility in the digital media. We aimed to *(i)* demonstrate how values can

be elicited using a combination of carefully designed scenario cards and culturally sensitive questioning; and *(ii)* understand (Saudi) women's specific values associated with online visibility. The account that follows focuses on the first concern as the orientation of this work is methodological.

The Cultural Context: Cultural Values in Saudi Arabia
The importance of being 'culturally competent' is illustrated in our case study with a transnational Saudi population, with whom we explore their online practices related to visibility and self-disclosure. We first took the position of a cultural understanding of this particular population, by drawing on Hofstede's [36] cultural values, Abokhodair *et. al*. [1] work on expression of identities online among users from the Arab Gulf, and the Alshehri *et. al.*' study [7] of transnational Saudis in which they identified specific cultural values and relevant stakeholders for designing in a Saudi context.

In Hofstede's model of cultural dimensions [37], Saudi culture has a very high score (95/100) on the power distance dimension. This means the hierarchal order and unequal distribution of power amount to generally accepted social norms [37]. This is a crucial trait to consider in a research study in order to manage power relations with and between participants. That is, participants coming from a culture with a high-power distance might expect *to be told* [37] what to do and be more inclined to *social desirability* [69]. Moreover, research studies conducted in the Middle East have pointed to ethical concerns regarding participants' perceptions that researchers have influence over and relationships with government [42]. Hence, interviewees are less unwilling to speak openly due to their mistrust of researchers and fear of political consequences [42]. This *culture of suspicion* [42] can lead participants to avoid ambiguous or unfamiliar situations; a factor referred to as *uncertainty avoidance* in Hofstede's model [37] and one which Saudi culture scores highly (80). Alshehri *et. al.*'s work [7] with transnational Saudis describe this as '*Concealing is the Answer';* participants tendency to conceal the autonomous-self [1] as a result of difficulty to express themselves autonomously, perceiving the act of autonomous expression as immoral, and fear of social or political repercussions. Amongst these, perhaps the political concerns are the most difficult challenge for researchers to address [42] and we take Alshehri *et. al.*'s [7] concluding question as inspiration: *"How to design safe spaces for self-expression within a culturally sensitive approach?".*

Addressing these challenges, and the problem of expression of the autonomous-self in particular, requires an understanding the collective facet of the self [7] and how to mitigate its effect on research participants when attempting to elicit their individual values. This collectivist characteristic is a widely recognized feature of Saudi culture [37]. As members of a collectivist culture Saudis tend to maintain interdependence within their society [37] and their collective self usually dominates any expression of their

autonomous self [1], thus requiring a particular emphasis upon giving them an opportunity to express their own values.

Population and Recruitment
The visibility of Saudi women in the public sphere has been increasing both virtually and on the ground over the past decade [5]. The recent reforms in the country, including allowing women to drive, are perhaps indications of an increased range of opportunities for women to participate in the public sphere [81]. However, women's appearance in media is still generally perceived as a source of shame to their family members, especially their male relatives [5]. Our population are transnational Saudi women whom experienced life in Saudi Arabia and abroad. This population represents the new cosmopolitan women in Saudi Arabia which are expected to create social changes due to their education, participation in the workforce and cultural fluency [54,56]. By way of a specific anchor, we focus this study on how they are represented in the digital media, using the appearance of women in media in order to act as a bridge (using the scenario co-creation cards) for discussing values.

This study was conducted between March and August 2017 in the United States and the United Kingdom. The participants were 18 females living abroad (UK=10, US=8) for educational purposes. They ranged in age between 19 and 35, and in education level from Undergraduate to PhD level students. Given the sensitivity, the study was conducted in private one-on-one semi-structured interviews [23].

Conducting the Interviews
The interviews were conducted following the scenario-co-creation approach indicated above. In our specific case, we incorporated Scenario Co-Creating Cards, as a value elicitation tool. To sensitize participants to discussing their views, the interviews began with two ice-breaking activities (10 minutes each) on Saudi women's visibility in the media. From the perspective of cultural competence, in addition to the in-depth investigation of the cultural context conducted by our team, the lead author - who had a direct contact with the participants - shares a similar background with them. She is a female Arabic speaker who has lived both in Saudi Arabia and in Western countries. She thus occupied an 'insider' researcher position [43] with a general knowledge of the context and participants background.

Data Analysis
The lead author conducted and transcribed the interviews in Arabic and then led their subsequent translation during the analysis process. The transcripts were analyzed (supported by the use of Atlas.ti), with initial codes by the lead researcher and subsequent discussion and refinement of code and themes with the second and third authors. We iteratively collated frequent and similar codes into overarching patterns indicating unifying concepts [12] , hence the 3 finalized themes. Since our themes focused on 'how' the method worked not 'what' the participants' lived experience is; this may seem as if these are "domain summaries [12]". However, we recognize these as themes as they capture

recurring patterns in participants' expressions of values as opposed to summarizing 'ununified' data regarding a specific topic (i.e. domain summaries) [12].

FINDINGS

In what follows, we discuss the emerging themes reflecting how our method assisted participants to arrive at values and value tensions. Where appropriate, we illustrate certain discussions with the cards that were used by our participants, to aid the reader in understanding the context.

Overt and Implicit Expressions of Values

Certain values were often elicited directly from our participants upon presentation of the relevant scenario co-creation cards. The concrete manner in which the scenarios were presented and scaffolded by the cards assisted the participants in articulating a value. They could often root a value in a relevant scenario with little prompting from the researcher. The most striking example of this was the value of 'socially-accepted achievement', where participants would expect that they should only be represented in the media when they have personally achieved some kind of success (as measured by norms in Saudi-Arabia). An explicit example is P1 associating visibility with high achievements:

> I would only use my picture if I had made a great discovery or something like that, I would then deserve to be there [in media]

On other occasions, the participants were less direct at arriving at a value, but they nevertheless provided a clear narrative that enabled the researcher to identify the value, that was actually arrived at. For instance, consider this exchange with P16 (cards shown in **Figure 2**):

> Researcher: imagine you are playing sport, what would the local newspaper say here? Bearing in mind it is read by many religious men.*
> P16: Maybe a Saudi woman climbing Everest … the photo might not be a personal photo; it would be for the woman while climbing the mountain.
> Researcher: Which is you?
> P16: Yes, but not the face.

(*As noted in our methodology, the scenarios are constructed based upon participants' interpretations of each card while the researcher here is merely restating and summarizing what the participant described of each card prior to this excerpt of the interview.)

Figure 2. The scenario cards discussed by P16.
(Left to right: a man, a newspaper, a woman running.)

By 'not the face', P16 meant that she should not be in the media (i.e. her appearance should be anonymized, which in

and of itself perhaps implies a value to that effect). Yet, she would still want to be associated with achievements e.g. 'climbing Everest'.

There were some scenarios that were somewhat more challenging for certain participants, although this also led to overt values. As an illustration, P13 could not imagine being on television as a cashier: the scenario simply confounded them:

> Researcher: Imagine a scenario where you appear on TV as a cashier?
> P13: In the news?… Honestly, I don't know… (silence) … There is nothing special because many girls now work as cashiers …

However, even when P13 could not provide us with a scenario, the justification of her struggle revealed the same value of 'socially-accepted achievements' which was expressed in her words as being '*special*'.

In another approach to respond to challenging scenarios, some participants attempted to move the scenario onto something else to avoid the challenge, where they would prefer to change the role card to another one, for example (with P11) from a cyclist onto a scientist:

> Maybe like a doctor, a scientist that discovered something or had a patent in something, or entered a project and it succeeded … but as a cyclist, I can't imagine anything where I am in a movie for having done achievements"

This also suggests that the struggle to create a scenario with the provided cards reveals the value of 'socially accepted achievement' as a narrow construct which is heavily favored by specific societal norms and prejudices (e.g. the idea that a scientist could achieve something, but a cyclist could not).

Distinguishing Individual and Collective Values

The cards also actively encouraged participants to imagine and compare new scenarios distinct from their current social reality. In turn, these revealed some deep individualistic values, through the introduction of hypothetical scenarios of the participants own creation. In other words, they used idealistic settings as a platform for expressing the values which they were concerned with. An illustrative example is P5, who would prefer a society where it would be possible for women to have their photos visible in public:

> Researcher: If you appeared in the newspaper would you put a photo of you?
> P5: Currently in my conditions now? No, not my photo … but my daughters I wouldn't want them to be like that, like 'ooh no photos!' On the contrary, I want them to appear even if without hijab.

Whilst this example is somewhat subtle, she is projecting an aspiration of how she personally would like a future society to operate, and therefore her expectation that society should be more open (or to put it another way, a value of 'freedom of expression'). This aspiration was also echoed more directly by P6, when projecting her values on her daughter:

> Researcher: If your picture appeared in the news with your daughter, what would that look like?

P6: Do you mean me my own desire? I will appear with my daughter, regardless of her wish to wear hijab or not, I don't mind, people might say she does not represent Saudi women, at that time [in the future] I won't care about what they would say.

Sometimes this projection on aspired scenarios would begin with a clarifying question, which in effect amounted to permission for participants to move into an individualist attitude (as in *"my desire?"*).

In other cases, participants could be abrupt and very direct, as demonstrated by P7 **(Figure 3)**:

Researcher: In a political production, you are aware that the government can watch, you were asked as a traveler to compare countries you lived in, in terms of laws and policies?
P7: I wouldn't be able to enter Saudi (laughter) trust me … like Saad Alfaqeeh (a political dissenter banned from entering the country) … I might accept talking about things but if they guarantee nothing would happen to me and I would be able to enter the country as a visitor for example … I might speak up as I have lots of things to say that I might explode but only if I'm granted a place to live in … maybe because my parents have passed away, so Saudi Arabia doesn't mean much to me.

Figure 3. The scenario cards discussed by P7
(Left to right: a police car, a clapperboard, a woman with suitcases.)

These types of discussions are also important in another sense, in that they demonstrate a willingness to discuss deep desires and issues that are controversial or 'taboo' in the context of the study, whilst also providing a vivid account of the social pressures that govern their day to day lives. Our participants often compared values where tensions might arise. For instance, P12 is comparing 'visibility' to 'collective identity' where her primary concern was not upsetting her father. The effect on him is held to be more important than appearing in public.

Researcher: As per your experience with dancing, you said it is like an exercise and it helps change your mood, let's say they asked you on a seminar to go on the stage and talk about your experience with dancing and say what you just said about it, there are religious men in the seminar …
P12: Hmm, I feel there's no difference, but also, I don't know!
Researcher: Hesitant?
P12: I might be hesitant but not because of the religious men, because of papa, because I respect papa
Researcher: How would that affect him?
P12: I don't know, I feel that, he doesn't think that this topic is very important, and you know older generations are different from younger ones, I feel that he would think this is a silly topic or something like that … so if I would refuse it would be because I respect my papa.

Whilst there was an element of contradiction in P12's arguments, they also (overall) make logical sense and reflect the very real and pragmatic value tensions that they have to contend with in their day-to-day lives.

Presenting a Nuanced View of Values
It is clear that allowing participants to have *flexibility* in exploring different scenarios on their own terms was an effective means for identifying values. This became more obvious as participants moved to compare one scenario to another, unpacking different aspects of the scenarios, which led to a broader exploration of a particular value, and a concreting of their position. Below, we demonstrate a comparison of three aspects among other aspects in the data.

Across our participants as a whole, the level of expected *visibility* crossed a full spectrum with a value of 'highly visible' at one end, and 'completely invisible' at the other. For instance, when the researcher raised the issue of talking in a newspaper (and being visually depicted) with P9, she responded by comparing different levels of visibility: writings, photos and voice (**Figure 4**):

Researcher: So, is it easier for you to talk in the newspaper about sensitive and personal topics than disclosing your photo and talking about mundane non-sensitive topics?
P9: Yes, I don't know [why] maybe like I said I don't like to appear physically in the media, then if I appear I would appear with distinct writings, educational not trivial. The [social] image for me is important (laughter)
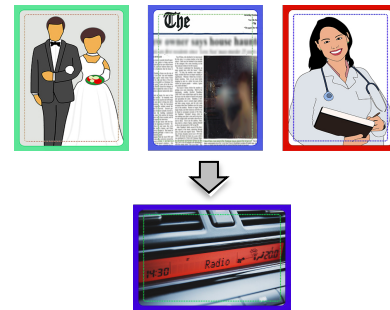
Figure 4. The scenario cards discussed by P9.
(Top row - left to right: a bride and a groom, a newspaper, a woman in white coat;
Bottom row - under the newspaper card: a radio.)

Moving on to a different medium, namely radio, the response referred back to another level of visibility, 'writings', to express her views through comparison:

Researcher: What about Radio?
P9: possible … the voice is still more difficult than writings

Some participants also raised the level of permanency as a means for distinguishing between whether or not they would publish material on social media:

P2: I may post photos but not in Instagram or anything that might be saved or published, it would only be on Snapchat

This demonstrates the need for flexibility: if the discussion of values was not being conducted in an open and expansive

manner, then the actual expression of values would have been muted or curtailed by being overly fixated on a given context. Whilst our participants occasionally showed reluctance in discussing this topic, it nevertheless made it clear that their position on the topic in question (visibility) was somewhat situated in the level of formality of the media. For instance, P14 referred to a state media as an 'institution':

> *I feel that TV, no matter what you are in TV it means something, … it is an institution, but in Snapchat … you don't know how people might use your photos. A man can say to another, oooh, I have your sister in my Snapchat … but in TV, it is ok, he might say my sister is famous and brag about it (laughter).*

With P14, this issue was concreted in respect of their familial relationships. Accordingly, the discussion of values is strongly tied to a given scenario and the wider consequences connected to that scenario. With respect to media in which someone might appear, the level of permanency, the social cachet and the nature of the relationship that said appearance might convey are all matters which can influence whether (or how) a value is articulated, and the extent to which it might be emphasised by an individual. Furthermore, through comparing scenarios, it is possible to identify values (or their relative importance) based upon seemingly contradictory accounts expressed by participants. For instance, in respect of P13's account on when it is likely for her to consider other people's judgements on her (or her daughter) appearing in media:

> *Researcher: About your daughter, you said when people objected to her appearance without a hijab, it affected you, but their objection on you appearing as a cyclist didn't affect you?*
> *P13: First I won't appear without hijab, where is that case because in our community and family she must wear hijab by now… [I believe] she is supposed to.*

This contradiction in what was said previously highlighted the tentative - and somewhat incoherent - views that P13 held in respect of whether or not someone considers societal judgment in their decisions to appear in media. Another advantage of these contradictions is the opportunity they offer to unpack some value tensions through comparisons.

DISCUSSION

We first consider the operation of each element of the method (Scenarios, Co-Creation and Cards) and then discuss the wider implications for value elicitation methods.

Scenarios

The use of hypothetical situations is less personal to the participants and less intimidating [30]. In our case, we found that the hypothetical nature of the scenarios played a significant role in providing participants with a wide space for making deliberate choices (or the avoidance thereof) and the justifications underpinning their choices. In this regard, the questions that were asked by participants are important, such as: *'in my current conditions?', 'my own desire?' or 'shall I talk about myself currently or [as] the team leader in the scenario?'.*

This shows that participants were inclined towards using the cards as a means for creating a hypothetical scenario to better frame discussing their own values. The participants were then able to use this hypothetical scenario to make cross situational comparisons (as suggested in our four principles): examples include a comparison between roles 'e.g., a scientist vs. a cyclist' P11, the media 'e.g., permanent vs. ephemeral' P2 or even implicit components such as place and time, or across generations as in P6's reference to her daughter. Accordingly, the hypothetical element provided a tool to eliminate cultural constraints [18] by taking the pressure off the participants and projecting their aspirations on their future self, children or idealist society. Indeed, it has been suggested that hypothetical scenarios allow the bypassing of socio-cultural structures [18] and encourage free expression [39] both in relation to existing practices, or exploring the future [18]. This also allowed our participants to explore different types of situations and contexts, and thus an exploration of a nuanced view of values in a cross situational manner. This is in line with research [30] suggesting that the use of vignettes allows making complex contexts concrete, which triggered people's engagement and reaction with strong emotions in the discussion. This is perhaps due to the narrative nature of scenarios which is proved to provide a concrete language to understand subjective experiences in real context [11,55]. The overall evidence is that a flexible hypothetical element is worthy of consideration in any culturally sensitive VSD method going forwards.

Co-Creation

Allowing participants to create their own props (i.e. using generative tools) empowers them, increases their engagement in the discussion, and scaffolds their expression of a wide range of unique personal emotions and experiences [11,62]. In our method we found that the co-creation element, wherein participants could in effect generate their own props for discussion, provided a flexible participatory approach, giving the subject sufficient control in choosing how to structure the scenarios in ways which were of interest to them: an exemplar of this is P13's engagement. Indeed, it has been suggested that incorporating ambiguity and incompleteness in scenarios allows participants to engage in interpreting and elaborating in multiple ways [61,79]. The co-creation element provided participants an opportunity to move between creating and projecting on hypothetical situations and recalling and reflecting upon real experiences of their own lives as in P16' cases. Further, the co-creation allowed the researcher a space to co-direct the conversation into creating challenging or unfamiliar scenarios to the participants to explore wider spectrums of values beyond the participants' comfort zone of familiar or easy topics.

This was either implicit in the method through including cards like a role of a 'dancer' or a stakeholder of a 'political figure', or explicit through asking the participants to reflect on scenarios even when they say they could not apply to them: e.g. when P9 expressed how she completely refused

appearing in the media, the researcher asked her to assume a different state of mind. This helped the participant discuss another value 'i.e. the collective identity' despite the fact she said earlier in the discussion it was not about her society, it was her own choice. Overall, the co-creation allowed participants to contextualize the scenarios in different ways reflecting their real experiences within cultural contexts and aspirations of their ideal cultural context.

Cards

The use of visual and the tangible materials as means of communication and making abstract arguments tangible has become an intrinsic part of dialogue in design [32,39]. We found that the tangible aspect of the cards functioned as a visual and physical aid which minimized the cognitive effort in recollecting scenarios (*i.e.* no need for 'free recall' [66]). Indeed, the use of visual material can be effective to evoke expression of feelings (emotional), understanding (cognitive) [62] and engagement in the discussion [79]. This made the process of making a choice inherently tangible, as changing the cards meant changing elements in the scenarios. The researcher regularly observed participants pulling the cards apart or together or referring to cards as 'this case' or 'here' by physically pointing to them during the discussion. This allowed more concentration and facilitated reflection upon the values. This is in line with Hornecker [39], who argues that cards are like physical tokens working as reminders and props for conversation. It has also been found that cards encourage non-linear progression and enabled participants to make tangible discussion by spreading out the cards to make comparison and connections between different concepts [79]. Moreover, the use of cards is a form of game, and has a playful nature. Such a strategy is suggested to take pressure away from participants and facilitate expression of personal experiences [39]. It has been argued that shifting focus to the game is a less of a value-laden approach and thus allows for power relations to be downplayed [11]. This addresses a cultural barrier of our population of being a typically difficult group to involve in research (and have the necessary trust in researchers to do so [42]). Further, the pre-designed cards emphasized the hypothetical nature of the conversation where participants were projecting on hypothetical photos, not their own ones. This helped depersonalize the conversations as it was clear to participants that some challenging questions were not raised specifically for them but instead arose randomly from the cards. This is in line with research [48] suggesting that use of artifacts helps free people to envision alternative ideas from their pre-conceived ones without decoupling them from their reality. The tangibility of the cards and the nature of the setting utilized play to allow participants see, feel, and play with the cards freely during the discussion.

IMPLICATIONS FOR VALUE SENSITIVE DESIGN

Looking forward, there are wider implications for VSD and in particular the development of 'value elicitation' methods. Notably, by offering a multiplicity of different mechanics within one method, we provide more flexibility (and thus opportunity) for participants to express their values. This is inclusive: because certain values are less likely to be expressed without there being the right opportunity to do so (especially with certain populations), we afford a wider opportunity for people to express values and in turn, have them taken into account in the design process. Accordingly, when creating new value elicitation methods, it is important to account for the 'principles' identified in the background, as well as considering each of the mechanics we have shown to work above. The key lesson is a cumulative one: namely ensuring that there is a wide canvas available to participants, thereby maximizing the chance that *their* values will be identified and ultimately addressed and/or responded to.

More importantly, the integration of the cultural effects in the design and mechanics of the method enabled us mitigating cultural barriers on value expression. There is a wider point of practical importance. We notice that the pragmatics (and resource implications) of identifying values have been a reason for VSD to attempt to utilize general moral values that are often inappropriate for the setting at hand (see [10] for why such an approach would be troubling). The effect will be the semi-exclusion of the group whose values are being omitted, and likely, a system that is generally less effective, for the reasons already extensively canvassed in recent works about VSD's limitations in respect of values [10,47,53]. The relative efficiency of the method that we have offered is also of importance: not only have we shown that it is possible to obtain values from a challenging group whom might otherwise be excluded, but we have demonstrated how this can be done efficiently. We hope going forward that this work will make it less necessary to rely upon lists of values and instead rely upon the evidence generated by this method (and developments thereof), thus ensuring that future designs are more likely to reflect the needs of such populations.

CONCLUSION

The identification of the values of people who are likely to interact with an information system is a fundamental concern in VSD. In this work, we have argued that cultural context is a critical issue to consider in value-oriented approaches of design. Hence, we utilized an implicit approach in order to elicit a broad range of values from a population of Saudi-Arabian transnational women, a group for whom the articulation of values might be expected to be difficult. We have demonstrated the mechanisms by which scenario co-creation cards were particularly helpful as prompts for discussions that led to expressing values explicitly and implicitly. As such, we illustrate how values might be elicited in other challenging scenarios. More importantly, we also noticed that the mechanics of how the values arise depend on the nature of the value itself and how that values expression might be constrained by governing social norms and expectations. It is our hope that this work will assist VSD to become increasingly inclusive of a range of cultures and backgrounds going forwards, by more effectively responding to their underlying values.

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