Revisiting Gendered Web Forms: An Evaluation of Gender Inputs with (Non-)Binary People

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Gender input forms act as gates to accessing information, websites, and services online. Non-binary people regularly have to interact with them, though many do not offer non-binary gender options. This results in non-binary individuals having to either choose an incorrect gender category or refrain from using a site or service—which is occasionally infeasible (e.g., when accessing health services). We tested five different forms through a survey with binary and non-binary participants (n = 350) in three contexts—a digital health form, a social media website, and a dating app. Our results indicate that the majority of participants found binary "male or female" forms exclusive and uncomfortable to fill out across all contexts. We conclude with design considerations for improving gender input forms and consequently their underlying gender model in databases. Our work aims to sensitize designers of (online) gender web forms to the needs and desires of non-binary people.

CCS Concepts: • **Social and professional topics** → **Gender**; • **Human-centered computing** → *User interface design.*

Additional Key Words and Phrases: Gender; user interface design; web forms; input fields; survey methodology

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1 INTRODUCTION

Gender is baked into every facet of human life; it is an aspect of human identity integral to individuals and social groups [74, 97]. Despite its universality as a concept, gender is not a simple or universal construct. Gender is experienced and expressed differently, depending on culture and locale [2]. Nearly every society has ingrained gendered norms into its political infrastructures. Government documentation, from local relevance (e.g., birth certificates) to the necessity of international interoperability (e.g., passports [87]); global health data (e.g., [17, 50]); and physical spaces, like gender-segregated bathrooms [23], are all examples of implementing infrastructure that reinforces dominant gender norms.

Just as gender is interwoven into physical, paper-based infrastructures, gender is also deeply intertwined with technical infrastructures. Gender is presented as a relevant factor in a number of technologies from social media websites, like Facebook [11], to computer vision technologies, like automatic gender classification [81], and numerous

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commercial applications, like pet food stores [88]. Across various infrastructures, gender representations most often continue a dominantly Western history where valid genders were solely binary—"male" or "female," "man" or "woman" [73]; with drastic consequences for transgender and/or non-binary [82]) people[1] even though their genders have historical roots in numerous traditions and cultures [12, 72], and are increasingly visible in modern Western contexts [31].

Human-Computer Interaction (HCI) research on gender in technical infrastructures is increasingly prompting questions about representation, erasure, and the associated power behind constraining identity categories. Previous work has raised critical concerns about the negative implications gender misrepresentation in technologies could have (e.g., [34, 49, 81]). In particular, non-binary individuals, who never fit into binary categories bear the brunt of misrepresentation and erasure [88]. Furthermore, non-binary individuals are either regularly ignored in broader research on trans communities, or lumped in with binary trans individuals, who often have different needs and perspectives on gender [48, 95]. Yet, whether non-binary genders are included or not, non-binary individuals still have to interact with web forms—or else be faced with the impossible choice between 1) being forced to provide inaccurate information, which comes with additional labour of explaining discrepancies between actual gender and represented gender; or 2) accepting they will be excluded entirely from participating in a system or service. Further, it results in bad data for those collecting gender information and for the users of web serves meant to benefit from that information's use.

Motivated by previous work on non-binary representation in technical infrastructures, as well as research discussing the damage misgendering[2] and living as an inauthentic gender can have on trans individuals [45, 64], we sought out opinions of binary (both cisgender and trans) and non-binary individuals on gender input forms across different contexts. We were particularly motivated by the success of Scheuerman et al.'s HCI Gender Guidelines, released in 2018 [80]. The guidelines have provided HCI researchers with the language tools to better define and describe gender in writing and research contexts. However, the guidelines only provide general guidelines towards inclusive survey design (e.g., use open text forms when possible) and lack direct implications for web forms. Further, context is largely missing from the guidelines, though context largely shapes how gender is utilized on forms (e.g., medical forms using biologically-determined definitions of sex).

Thus, we sought to validate and expand on these theoretically-based guidelines by offering empirically-based evidence on the inclusiveness of web interfaces. Further, we sought to understand how the context of the web service impacted the inclusiveness and usefulness of the web form. Specifically, we aimed to answer the following research questions:

- How does the evaluation of gender input forms differ between binary and non-binary individuals?
- How do these evaluations vary across different presentations of gender in input forms?
- How do these evaluations vary across different contexts in which these forms are used?
- How do people explain their preferences for some gender presentations in input forms over others?

To answer the above questions, we developed a survey to understand the inclusiveness and comfort levels of five different gender web form options, ranging from radio buttons to open text boxes, in three distinct contexts: (1) a digital health intake form at a doctor's office, (2) a social media website, and (3) a dating app. These three contexts represent different domains with greatly different goals, but where gender is regularly embedded at the beginning of an interaction: in the web form. Medical care facilities are a necessary aspect of health where one must offer up highly

[1]Trans, short for transgender, is an umbrella term for individuals who do not identify with the gender they were assigned at birth (cisgender). Non-binary people's genders fall outside of binary conceptions of male and female, and may include genders like genderqueer, agender, and genderfluid. Intersex people may have any gender but share experiences around having their bodies medicalised and policed as deviant [25].
[2]The action of misidentifying a person's gender, intentionally or not.

personal information; social media websites are spaces of social interaction, often fueled by a sense of belonging and connection; and dating apps are spaces where the synthesis of identity and desire are brought to the forefront.

At a high-level, we offer four methodological contributions alongside our findings and recommendations. First, we have empirically tested previously untested options posited as inclusive by other researchers and institutions. Second, we offer quantitative measures and qualitative perceptions of inclusiveness, comfort, and willingness to access platforms depending on their gendered forms that designers can use to ground their decisions in. Third, we test participant perceptions about how hypothetical contexts effect perceptions of web forms. Fourth, we offer a case study through our methods on how to inclusively group cis and trans participants into binary and non-binary categories when studying gender perceptions.

We found that participants, both binary and non-binary, generally preferred forms that made use of open text boxes and multiple-checklists, associating them with increased inclusiveness, freedom, and flexibility. Participants also expressed distaste for binary "male or female" options, objecting to the exclusion of non-binary and/or intersex people. Similarly, participants disliked language they described as "othering" [3] Examples include using the term "other" or "something else" to present additional gender options, which can insinuate that those who fall outside of the binary are seen as deviant and abnormal. We discuss what these findings mean for gender representation at the levels of interface and infrastructure. Building on recent work to improve inclusive gender representations in HCI and interface design [82, 89], we then contribute considerations for designers and researchers looking to improve the inclusiveness of their gender input forms in primarily Western contexts, given our participant sample. Acknowledging the contextual social reality of gendered interactions, we center context in our discussion of designing gender input forms.

2 BACKGROUND

2.1 The Construction of Gender

Historically, developmental psychologists embraced the notion that bodily sexual characteristics determine gender [6]. For example, the biochemical theory states that biological characteristics are the major determining factor in gender identity development [16]. Likewise, learned behavior and social sex segregation have often been viewed as complimentary to this process [63]. Early feminist scholars also adopted this worldview. Nicholson described the sexed body as the "coat rack" on which gender is metaphorically draped [67]. In other words, gender is seen as a social experience reliant on sexual characteristics.

Many feminist and trans theorists have since rejected these biologically deterministic views, embracing gender as a social construct without an inherent binary. In place of biological deterministic gender, numerous contemporary critical and social constructivist theories of gender embrace trans identities. Reiches, in particular, criticizes the rhetoric of "essential difference" inherent in the gender binary [73]. Fausto-Sterling deconstructs the binary worldview by illustrating the biodiversity of sex in *Sexing the Body*, revealing how the sociocultural context of knowledge production contributed to gender being assumed to be a strictly binary construct [25]. Namaste offers an empirical perspective of social gender realities, embracing the "objects of study" that critiques where gender theory fails to acknowledge the lived realities of trans individuals [66]. These binary conceptions of gender have also ignored the rich history of non-binary and third genders (e.g., [2, 72, 75]). Even while some Western governments have begun to legally recognize non-binary genders (e.g., Australia, The United States, Denmark), Western practices have largely erased otherwise naturalized and rich histories of non-binary genders in non-Eurocentric cultures [41, 60, 101].

[3]The notion of creating an "us" versus "them" culture, which views another group as inherently alien or inferior [21]. We engage more deeply with research on othering in Section 2.3.

At their core, these critiques point towards a normative construction of gendered reality that has—often intentionally—normalized cisgender bodies and "othered" trans and intersex bodies [15]. As such, trans activists and scholars have begun to critique distinctions between a biological binary and the draping of an "internal" social experience of gender into that binary. Repo traced the lineage of gender as separate from sex to transphobic and anti-intersex histories of sexology, as well as anti-trans discourse in second wave feminism [74]. Lane and Stryker argue for more diverse and trans inclusive perspectives on biology [52], where the sex/gender disctinction can be considered transphobic in separating the body from the mind [86]. In other words, some trans people consider both their body and mind aligned, despite mainstream medical discourse that insists they are not [86]. Trans scholars outside of United States and Western context have critiqued the language that otherwise excludes non-cisgender languages, perspectives, histories, and cultures [56, 92]. Baumgartinger uses the term sexgender to acknowledge the global diversity of the relationship between the interconnected concepts of sex and gender [10]. While this study primarily reflects the perspectives of Western participants, we align with the need for heterogeneous and culturally contextual approaches to gendered language.

We build on prior work on gender and in trans studies by adopting the worldview that trans, intersex, and non-cisgender perspectives should be adopted more readily in research and in practice. As Roberto points out in [76], taxonomic classification of identities in online infrastructures construct normative ideas about gender. Despite contemporary critiques of binary gender, most existing input forms encode it as a strict, immutable binary [11]. Hence, we identify a lack of nuanced understanding in how gender can be more flexibly represented to account for different lived experiences. We still lack a nuanced understanding of how this stark contrast between modern concepts of gender and technological infrastructures such as input forms affects individuals with different genders. Designers of gender input forms do not understand how to represent gender diverse options on input forms. While Scheuerman et al. have contributed in-depth guidelines to improving language in research and reporting of gender diversity in computing [82], there is still a lack of empirical understanding of how historically gender input forms impact binary and non-binary perceptions of inclusiveness and comfort. Further, how the context of a web service might shape how gender should be captured has been absent from current work on gender surveys and forms. Given this, our research provides a detailed study of binary and non-binary perspectives on gender input forms to guide future designs. Doing so, we also extend previous guidelines [89] by providing an empirical base for considerations around gender input forms.

2.2 Operationalizing Gender in Three Contexts

Just as how our understanding of gender has shifted, gendered concepts differ depending on the situation. We examined perceptions of gender across three contexts: healthcare, social media, and online dating. In this section, we examine how gender has been examined and operationalized both research and practice; much of the research on forms informs how those forms have been used in practice (e.g., how gender is often operationalized on social media forms).

2.2.1 Gender in (Digital) Health. Health research has an extensive relationship with gender and the gendered body [25], with normativity coming with particularly dire consequences concerning health disparities [37]. Digital health, as a significant sub-focus of HCI research, has similarly explored gender-specific health concerns. In particular, researchers have centered cis women's health, focusing on uterus-specific health areas like menopause [54] and periods [24]. However, there has been far less work on the health experiences and needs of trans individuals. With the recent de-stigmatization of trans health, at least in Western contexts (e.g., [57]), came a growing focus on how best to treat trans patients [59, 84], who experience several barriers to accessing appropriate healthcare [79].

Only recently have HCI health researchers branched out to explicitly study trans needs. One example is Ahmed's work on building a digital speech therapy app for trans women [5]. Ansara uncovered instances where digital infrastructures barred trans individuals from accessing healthcare, unless they conformed to cisgender standards of gender on their identity [7]—an experience entitled "structural violence" [29]. Bauer et al. identified similar blockades, specifically through both informational and institutional erasure [9]. Gender forms are an example of institutional erasure: the lack of infrastructure to accommodate non-binary people.

Given these infrastructural barriers, determining how to format health intake forms to be more inclusive to trans individuals becomes a crucial endeavour. Hicks et al. used Twitter data to examine identity folksonomies to better understand how to improve gender identification on health intake forms [39]. "The Fenway Guide to Lesbian, Gay, Bisexual, and Transgender Health" acts as a guide to welcoming and inclusive practices for healthcare providers, including example intake forms [42]. However, while some legislatures are being forced to deal with new identification policies (e.g., [85]), it is still highly common for intake forms to utilize options that exclude trans people [32].

2.2.2 Gender on Social Media Sites. HCI has examined gender experiences on social media websites. However, like in much of the scholarship HCI has built on, it has built the backbone of its work off of biologically deterministic notions of gender, often embracing a perceived dichotomy between men and women. For example, Kivran-Swaine et al. examined communicative differences between men and women on Twitter [51]; and Wang et al. examined the differences between posted status topics and topic engagement by men and women on Facebook [96]. Miller et al. examined the gendered perceptions of Pinterest, driven by the disparity in use between men and women, ultimately making design recommendations to improve that binary disparity [65]. Given the ingrained history of patriarchal social roles, such research on men and women is beneficial and necessary. However, traditional gender research in HCI has often not questioned the reality or the impact of a dichotomous, binary stance on gender.

Recently, several HCI scholars have expanded research on gender experiences on social media beyond the binary of men and women. For example, Carrasco and Kerne conducted interviews with queer individuals, including trans ones, to understand practices of "selective visibility" [13]. Scheuerman et al. examined how social media spaces embed power imbalances in the interface, leading to harmful experiences for trans people across online ecologies and offline life [80]. Hawkins and Haimson examined trans peoples' use of Tumblr to seek mental health resources during periods of gender transition [38]. Such work sheds light on how social media practices are experienced beyond the binary.

However, there has been little work in HCI on the gendered infrastructures of social media websites—their registration forms and user profile options. In 2016, Bivens and Haimson conducted a walkthrough of ten popular social media accounts to understand how sign-up forms shaped and constrained gender possibilities for users, often to the benefit of advertisers [11]. The majority of the forms they examined contained male and female options, with a few allowing "other" inputs [ibid]. The gender limitations on these forms, and the ramifications of exclusion proposed by Bivens and Haimson, need further exploration. We bridge this gap by acutely examining the perceptions of common gender forms, on social media websites and beyond.

2.2.3 Gender on Dating Apps. With the rise of dating applications—social apps specifically tailored to finding romantic and sexual partnership—there has been an associated rise in social computing research on the subject. Much of this research has explored the practices and perceptions of individuals using dating apps. For example, Hancock et al. conducted a gender comparison of heterosexual men and women who report deceptive information on dating websites [35]. Yeo and Fung examined the affects of temporality of dating apps on relationship, focusing specifically on gay

men [102]. Hardy and Lindtner took a closer look at how the affordances of queer dating apps, Grindr and SCRUFF, construct a specific type of user—one which does not fit the lived experiences of rural gay men [36].

Gender plays a large role in how dating apps are designed, with the notion that the relationship between individuals is highly contingent on gendered attraction. Thus, in many HCI studies to date, gender has become wrapped up in sexuality: how are people of one gender or another attracted? Dating apps, for the purposes of making appropriate match recommendations, often asks for intimate information about gender and sexual preference, though trans populations often want to release this data in a staggered fashion [27]. Ostheimer and Somayaji questioned data privacy on dating apps, including the potential future risks of how sexuality data could be used [68]. They posit that identity data at the interface level may become uncontrollable and inaccessible in the future [ibid]. However, user input forms have not been a focus of dating research in HCI. Given the intricate relationship between gender and sexuality, our study explores how gender forms in dating app contexts affect binary and non-binary people's perceptions.

2.3 Gendered Infrastructures in HCI

Much of the HCI literature to date has examined gender as a fixed binary. For example, traditional user studies often compare perceptions, practices, and feedback between men and women (e.g., [19, 53, 91]). Others have interrogated the infrastructure within the confines of the male/female binary. For example, to critique the proliferation of masculine titles in web form drop-downs [62, 77] or to reveal gender biases in web image search results [47]. Only recently have computing researchers begun to include gender perspectives outside of a cisnormative purview, conducting work with trans individuals (e.g., [5, 33, 80]). Yet, like most other areas of life, the epistemological violence of erasing trans realities has become calcified in physical reality. Alongside a binary and normative gender construction is the reification of "otherness" through infrastructure: paper and digital documentation that restricts whose gender is valid, whose gender is objectively "real" [31, 66, 69]. The ACM Digital Library itself reflects this bias: at the time of this paper's writing, the keyword "transgender" yields 27 results and "non-binary" only an estimated 5 (though a marked improvement since the publication of Schlesinger et al.'s work on intersectional HCI [83]).

More recently, though, HCI and digital humanities scholars are attempting to understand the damage through historical and empirical studies of different technological infrastructures. For example, Peirera examined perceptions about oppression in web interfaces with LGBT individuals broadly [71]; Hicks revealed how gender policies in the U.K. reified gender across multiple digital and physical government infrastructures, making changing one's gender marker not only bureaucratically difficult but invasive [40]; and Scheuerman et al. [81] examined the ingrained binarism of facial analysis systems that detect gender. Several researchers have revealed the benefits of freeform tagging for trans people to define their own ontologies, like on Tumblr [20] or LibraryThing [4].

The othering effect of stigmatizing trans identities through historical and philosophical discourse, as highlighted in Section 2.1, has moved into digital spaces as well [18]. The reification of gender binaries into computerized systems calcifies the perspective that cisgender experiences of gender are normative, while trans, and particularly non-binary, experiences as "other." Motivated by the notion that politics and power are embedded in every interface [46], our study interrogates the othering of gendered infrastructure in web interfaces at the moment of user interaction. Specifically, we examine three contexts where gender is commonly encoded in input forms:(1) digital health; (2) social media websites; and (3) dating apps.

3 METHODS

We designed a survey to understand participants' perceptions and attitudes about different gender input form options that they might see in three different contexts. We recruited participants from public postings on social media websites, like Facebook and Twitter, as well as in online communities like Facebook groups for trans individuals. Participants had to explicitly agree to be at least 18 years old to participate in the study prior to gaining access to the survey. Before official deployment, we pre-piloted the survey with three author contacts to gather feedback on and improve the initial instrument. After iterating on the survey and receiving approval from our Institutional Review Board (IRB), we began to collect full data. In this section, we provide further details on the survey instrument and the participants.

3.1 Survey Contexts

We developed a survey to test three different contexts where individuals are likely to encounter gender input forms. In each of these contexts, participants were presented one of the following scenarios:

- **Healthcare Form:** "Imagine you go to a doctor's office or hospital seeking medical care. Before seeing a doctor, you are told to fill out a digital intake form on a tablet. This form asks you to fill out personal information."
- **Social Media Website:** "Imagine you are signing up for a popular social media website. All of your friends use this website to chat, coordinate events, and keep in touch. Before being able to access the website, you must register using your personal information."
- **Dating App:** "Imagine you are signing up to use a popular location-based dating app. In order to sign up and begin using the app, you must first create a profile. In the profile, you must fill out your personal information."

We chose to use different contexts to test whether perceptions about comfort, inclusiveness, or willingness to access might change across them. Given social media, dating, and health have vastly different goals and social outcomes, we wanted to understand whether or not context would play a role in form assessment. Furthermore, these three contexts regularly require gender input forms, and (as illustrated in section Background), have well-established norms and expectations for how to ask about gender on forms. Thus, we researched *existing* and *recommended* gender input forms on social media sites, dating apps, health forms, and in research literature to generate five different gender forms for our survey instrument (see Figure 1). We hypothesized that participants might express more willingness to access certain contexts despite the perceived inclusiveness or comfort of the form.

3.2 Survey Instrument

To mitigate ordering effects, our survey used a randomized design. Each participant was randomly assigned one of the three contexts. Within those, participants were each shown five different gender input forms (see Figure 1).

We decided to test only single-step forms for two reasons: (1) most web apps and websites do not use two-step forms for gender information; and (2) for different forms to be comparable across contexts and options. We openly acknowledge that some of the gender input forms options might be uncomfortable or exclusive to participants, but our intention was to empirically test and assess these constructs—and understand whether there are differences in perception between binary and non-binary individuals.

We used several sources to determine which gender input forms to test. Option 1 was selected as it is still one of the most commonly utilized forms across different contexts, including on social media [11]. Option 2 is now more commonly used when forms seek to be inclusive of options outside of the binary, although the language of "other" has been critiqued within scholarly research [89]. We sought to test whether participants also felt it was an inappropriate

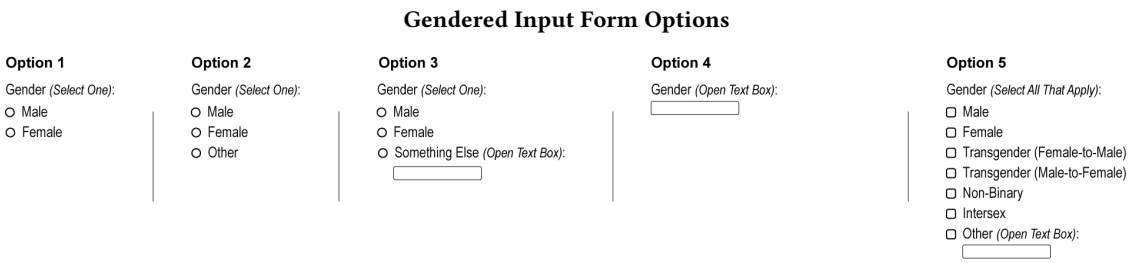


Fig. 1. Gender Input form options presented for each context. From left to right: **Option 1:** Select One: Male or Female (See: [11, 93, 94]); **Option 2:** Select One: Male, Female, or Other (See: [58, 89, 100]); **Option 3:** Select One: Male, Female, or Something Else (Open-Text Box) (See: [1, 8, 44]); **Option 4:** Gender: (open text box) (See: [3, 43, 70, 98]); **Option 5:** Select as many as apply: Male, Female, Transgender (Male-to-Female), Transgender (Female-to-Male), Non-Binary, Intersex, Other (Open-Text Box) (See: [22, 28, 30]).

option. Option 3 was utilized to explicitly test the HCI contribution made in [44], which had been proposed in the paper but not tested with participants. Option 4 was taken from numerous guidelines which proposed more inclusive and open gender forms than are typically utilized in survey methodologies (e.g. [43]). Finally, Option 5 has been proposed and used most often for being inclusive in medical contexts [30]; we sought to understand whether participants agreed such forms are inclusive and whether they transferred to other contexts. We chose to test the terms "male" and "female" on our form options given that the majority of prior literature, including trans inclusive literature, still uses "male" and "female" rather than "man" and "woman" (e.g., [22, 28, 30]). Using "male" and "female" language further allowed us to gauge reactions and feedback on this language, which is contested and shifting in trans discourse (as we highlighted in Section 2.1.) We acknowledge that the forms tested in this paper are not exhaustive, and there are many other forms–both one-step and two-step–which are also viable for assessment.

Participants were asked, but not required, to fill out each gender input form. We had initially required that participants respond to each alternative, but later iterated on the survey to no longer require this of participants, due to a non-binary colleague pointing out that this meant participants had to comply with categories that might be harmful. Thus, we changed the requirement shortly after starting data collection, but kept survey responses because the change had no impact on the data included in our analysis. We changed this to be more mindful of avoiding microaggressions towards participants who did not feel comfortable providing incorrect data but still wanted to to give feedback on the forms.

3.3 Survey Variables

Inclusiveness and comfort have been widely discussed in research on gendered language, particularly around defining gender and pronoun usage (e.g. [82, 89]). Misgendering has often been proposed as resulting in exclusion and lower emotional and mental well-being, particularly for trans individuals (e.g. [6, 45]). We imagined that these three variables would also impact the fourth variable: willingness to access. Thus, following the presentation of the gender input form, each participant was then asked to answer the following questions:

- **Perceived Inclusiveness:** "Rate how inclusive or exclusive this gender form is to you personally." (5-point Likert scale from extremely inclusive to extremely exclusive).
- **Perceived Misgendering:** "This form does not reflect my gender correctly." (5-point Likert scale from strongly agree to strongly disagree).

- **Perceived Comfort:** "Rate how comfortable or uncomfortable you were when choosing a gender on this form." (5-point Likert scale from very comfortable to very uncomfortable).
- **Willingness to Access:** "Will you fill out this mandatory form to access a doctor/social media website/dating app?" (Yes/No).

After answering these questions, we asked participants to reflect on all five input form options they saw. We reminded the participants what the options were, and asked:

- Whether they would fill out a form that does not match their gender in any particular context (Yes/No);
- Which was the best option and why it was the best option (open text box);
- Which was the worst option and why it was the worst option (open text box).

At the end of the survey, we asked participants demographic questions including whether their gender is binary, whether they are cisgender, their country of residence, and their age range.

3.4 Participants

After filtering out incomplete responses, we had a total of 350 responses that we used to conduct our analysis. Table 1 shows the detailed breakdown of the numbers of participants that were assigned to each context. Participants were also asked to fill out optional age and country data; 305 of 350 total participants did. The majority of participants' ages ranged from 18-24 (34.8%) and 25-34 (37%). 20% were aged 35-44, 6.2% were aged 45-54, 0.7% were aged 55-64, and 1.3% were aged 65-74. Most participants were located in the United States (69.5%); other common countries were the United Kingdom (7.9%) and Canada (6.6%). The remaining 16% participants were distributed across the following countries, in order of frequency: Australia, Germany, Netherlands, Sweden, Austria, Ireland, Mexico, Finland, France, Bahamas, Belarus, Belgium, Brazil, India, Japan, Portugal, Russian Federation, Singapore, Turkey, Venezuela, and Vietnam.

Participants				
	Healthcare	**Social Media**	**Dating**	***Total***
Binary	54	31	53	138
Non-Binary	63	67	82	212
Total	117	98	135	350

Table 1. Participant sample used in our analysis. Throughout the paper, participants labeled P-H represent health, P-D dating, and P-S social media (e.g., P-D10).

Of our 350 participants, 111 indicated they were cisgender and 239 indicated they were transgender. We grouped participants into binary and non-binary, regardless of whether they indicated they were cis or trans. We decided to group participants as such for two reasons. First, cis and trans binary needs often align more than non-binary needs in terms of gendering and pronouns [90]. Second, binary genders, even trans binary genders, are more widely accepted than non-binary genders [88]. We acknowledge that grouping participants in this way reflects value decisions on behalf of the authors, and may not be entirely reflective of participant identities. Nonetheless, we believe that this choice was done in a respectful manner to gain insight specific to our research questions. With this grouping in mind, we had 138 binary and 212 non-binary participants. Of the 239 trans participants, 202 were non-binary; 37 were binary.

3.5 Data Analysis

To conduct our quantitative analysis, we used descriptive statistics and visualizations to analyze participants' perceived inclusiveness, misgendering, and comfort, as well as their willingness to access a service and their rankings of the form options. For perceived inclusiveness, misgendering, and comfort, we also performed the Mann-Whitney U-test to compare the mean responses between binary and non-binary participants; we chose to use the Mann-Whitney U-test because the responses do not follow a normal distribution. Quantitative findings helped us to further situate the analysis of the qualitative data of open survey responses.

We took an interpretivist approach to qualitative analysis [61], generating knowledge through the construction of themes in which the authors embraced their salient expertise and reflexively assessed their own positionality during the coding and data presentation processes [78]. Our relevant expertise draws on Human-Computer Interaction, specifically Social Computing, and Gender and Sexuality Studies—as well as our lived experiences. Our aim was to illuminate the thoughts and feelings of participants as they filled out gender input forms. As we will show throughout our results, the qualitative comments from participants illuminate more nuanced understandings of participant perceptions, further complicating and challenging our quantitative results [26]. In presenting our findings, we use participant quotes to situate the larger quantitative trends that we identified.

In the first phase of our qualitative analysis, the first and third authors both separately coded a sample of 100 qualitative survey responses per context (300 total) to familiarize themselves with the data and separately outline preliminary themes. Following this phase, the entire research team met to discuss salient themes that we identified in the data. Before beginning the second qualitative phase, the first and second authors co-constructed themes based on preliminary quantitative findings; these themes became the larger themes tying together the qualitative themes identified by the first and third authors.

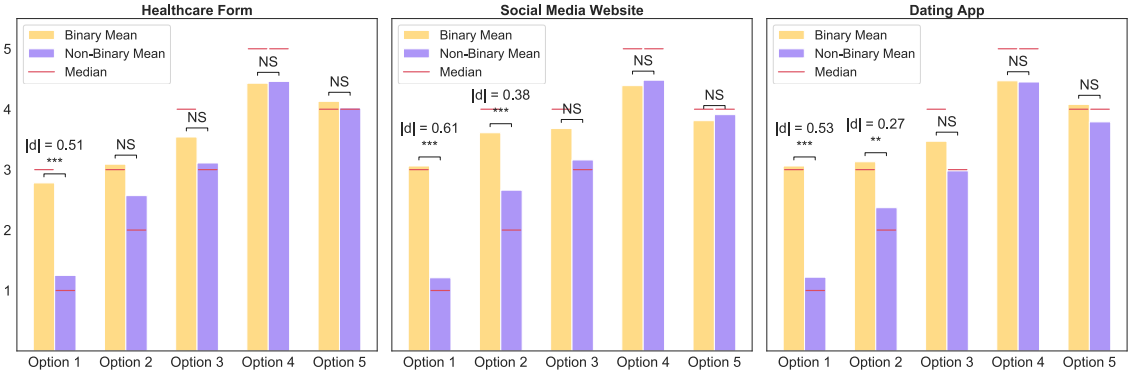
The first and third authors then conducted a secondary content analysis phase, where they nested existing lower-level themes under the pre-determined quantitative themes. The sampled data was revisited for their relevance to the thematic presentation of the quantitative data. The authors regrouped this data into relevant codes, and then once more converged together to assess agreement.

3.6 Limitations

Our study, including participant recruitment and survey design, was in English and as such, participants reflected primarily Western countries (particularly the United States, United Kingdom, and Canada) and thus, presumably, Western-centric perspectives. We acknowledge this limits the generalizability of our results and caution researchers and practitioners against utilizing results to make decisions about gendered forms in other cultures or on a global scale. It is also possible that the recruitment methods or the study itself, being aimed at evaluating gender forms, led to a self-selection bias that led anti-trans and anti-non-binary individuals to largely choose not to participate.

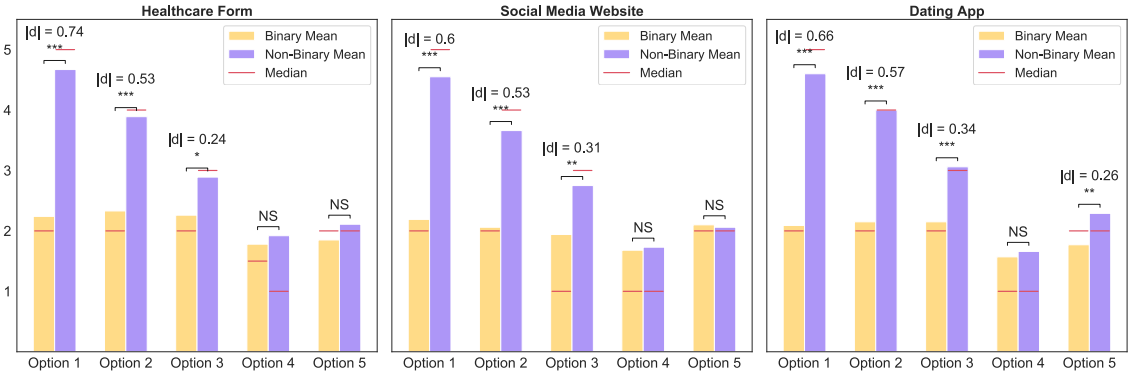
Further, our study reflects perceptions of imagined forms and contexts. We acknowledge survey contexts may garner different results than if gender input forms were presented to participants *in situ* (e.g., being filled out to receive actual medical care). Therefore, we emphasize that the survey method is not a substitute for interactions with real web forms or in real contexts, but offers participant perspectives on hypothetical scenarios.

Perceived inclusiveness: "How inclusive or exclusive is this gender form to you personally?"



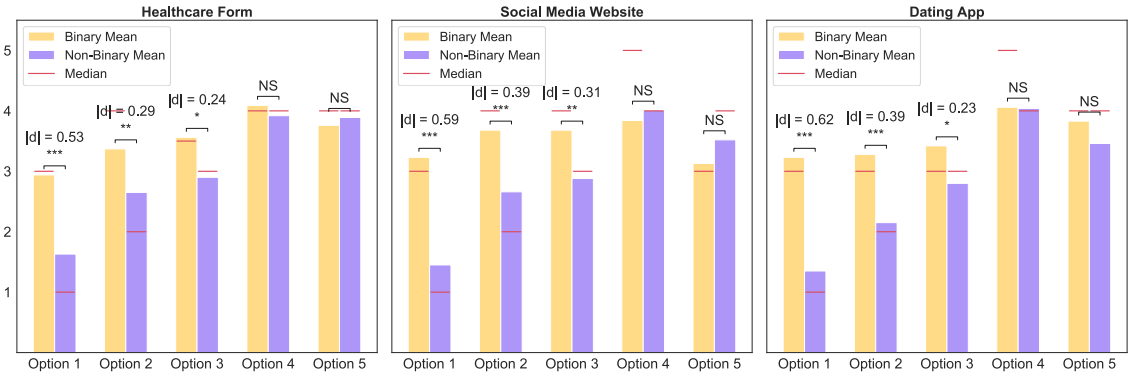
(a) 1 = Least inclusive, 5 = Most inclusive

Perceived misgendering: "This form does not reflect my gender correctly."



(b) 1 = Least misgendering, 5 = Most misgendering

Perceived comfort: "How comfortable or uncomfortable were you when choosing a gender on this form?"



(c) 1 = Least comfortable, 5 = Most comfortable

Fig. 2. Survey responses on inclusiveness, misgendering, and comfort across all contexts and all form options. Bars represent mean responses and red lines represent median responses of binary and non-binary participants. Mann-Whitney U-tests results (adjusted by Holm-Bonferroni correction) and effect sizes are indicated above each group of bars. $^{*} = p < 0.05$, $^{**} = p < 0.01$, $^{***} = p < 0.001$, NS = not significant.

4 FINDINGS

4.1 Inclusiveness

We conducted Mann-Whitney U-tests to compare binary and non-binary participants' perceptions of different forms options in different contexts. We found that non-binary participants rated Option 1 (Male/Female) and Option 2 (Male/Female/Other) as significantly less inclusive than binary participants did. The only exception to this was in the health context, where participants only rated Option 1 as significantly less inclusive. Overall, both binary and non-binary participants found Option 1 to be the least inclusive, and Option 4 to be the most inclusive. The full results are shown in Figure 2a.

Participants used open-text boxes on the survey to express what made certain forms feel inclusive or not. Our qualitative analysis found that forms rated as inclusive promoted feelings of *freedom*, or agency, for participants to be able to self-define their gender. For example, P-D10 expressed that Option 4 was best *"because one can answer exactly as one identifies."* Participants also felt that *flexibility* and *multiplicity* were relevant factors for web form inclusiveness. For example, P-H14 preferred Option 5 *"because it allows for situational flexibilty."* They liked that they could choose multiple options and control the granularity of information provided. Several binary participants also expressed support for including non-binary individuals. For example, P-S3, a cisgender woman, stated *"My child is non binary. I would appreciate them being able to check an option for their gender preference."*

Some participants felt particularly included when their gender was visible on a form. For example, P-S11 felt the developers of Option 5 were attempting to be inclusive by showcasing non-binary options. P-S75 stated *"Visibility is a means to an end to further acceptance of the 'more than two binary genders' fact."* Explicitly listing non-binary genders, hence, could help further their *normalization*. Some participants appreciated the equalizing tendencies of the open text box. P-S71 indicated that *"there is no assumption that the binary genders are 'normal' and anything else is weird."*

Participants also described what made forms feel exclusive. A salient trait were the static *constraints* in which respondents would be expected to articulate their gender. P-S75 stated that Option 1 was the most exclusive because *"having only two [gender options] is limiting AND promotes the erroneous image that there are only two, binary, genders."*

4.2 Misgendering

Results showed that non-binary participants rated Option 1 (M/F), Option 2 (M/F/Other), and Option 3 (M/F/Something else) as being significantly more misgendering than binary participants did across all three contexts. Additionally, in the dating context, non-binary participants rated Option 5 (checkboxes) as significantly more misgendering (see Figure 2b). Overall, Option 1 was perceived as the most misgendering for non-binary participants, while Option 4 was the least misgendering. Binary participants indicated far lower rates of misgendering across all options.

Participants whose gender was not represented indicated distress about not only being *misgendered* by the form but also having to be complicit in that misgendering. P-D62 called this *"[forced] self-misgendering,"*. Alongside deep-rooted discomfort, participants also mentioned that the resulting categorisation of their gender led to inaccurate reporting and, subsequently, incorrect data. In some cases, participants felt that they were "lying" (P-S37) by having to choose "male" or "female" when neither of these options reflected their gender.

Qualitative responses about misgendering were heavily tied to the concept of "*othering*". For example, P-H26 expressed their dislike of Option 3 because *"'Something Else' is dehumanizing."* Similarly, P-D59 wrote of both Options 2 and 3, *'Although somewhat more inclusive, ['other' or 'something else'] silo all non-traditional gender expressions into one group, which produces an island of misfit toys effect."* Being separated into a catch-all category from the defined "male" and

"female" options insinuated to many non-binary participants that their gender was somehow different, creating the feeling *"they do not belong"* (P-S31).

4.3 Comfort

Results showed that non-binary participants rated Option 1 (M/F), Option 2 (M/F/Other), and Option 3 (M/F/Something else) as significantly less comfortable than binary participants did across all three contexts. Overall, forms that participants rated as having low inclusiveness and high misgendering correlated with low feelings of comfort. Non-binary participants were significantly less comfortable with Option 1 than binary participants, though Option 1 was generally the least comfortable form across all contexts. The full results are shown in Figure 2c.

Participants expressed a sense of comfort and safety with forms that they already found inclusive of their gender. P-H7 described Option 4 as "the most inclusive, low to no stress," drawing a line between inclusiveness and stress level.

Yet participants' experiences of comfort were highly context dependant. For example, P-H14, a binary trans person, wrote, *"Being able to control when [my trans identity] is shared makes seeing a doctor feel like a safer experience."* Other participants worried about reporting gender incorrectly on a dating app because people may *"react violently"* (P-D86) to finding out a person is trans after matching with them. Similarly, P-D11, another binary trans person, expressed disclosing their trans identity on dating apps to maintain safety: *"I like people knowing I'm trans (and my specific identity) ... before we start talking so I don't accidentally end up speaking to someone transphobic."*

4.4 Willingness to Access

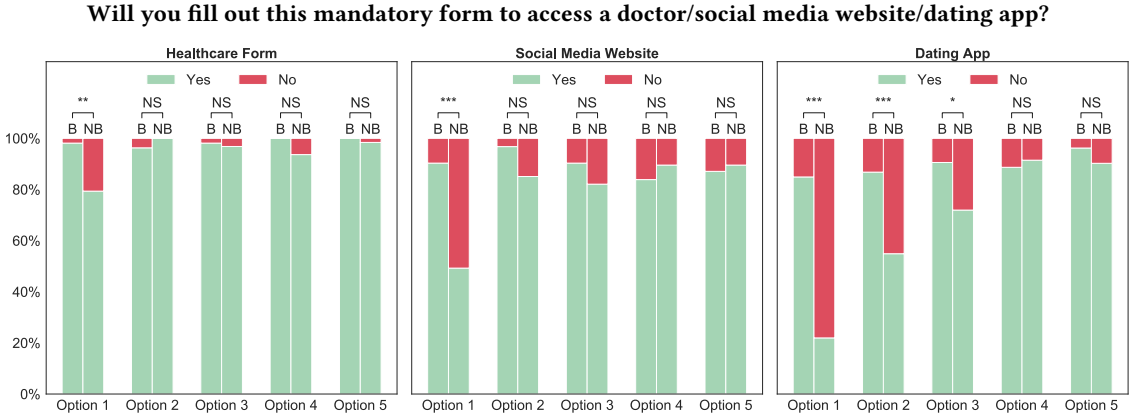


Fig. 3. Percentage of participants (B = binary; NB = non-binary) that answered yes/no to willingness to access questions. χ^2 tests results (adjusted by Holm-Bonferroni correction) are indicated above each group of bars. $^{*} = p < 0.05$, $^{**} = p < 0.01$, $^{***} = p < 0.001$, NS = not significant.

Our quantitative analysis shows that, in the Healthcare context, less than 5% of binary participants across all five form options refuse to fill out the gender form to access a doctor. Similar results hold for non-binary participants—less than 10% of non-binary participants would not fill out the form to access a doctor for Options 2, 3, 4, and 5. The only exception is Option 1 (M/F), which 20.63% of non-binary participants would refuse to fill out. Full results are shown in Figure 3 and Table 2.

Context	Option	Binary Yes %	Binary No %	Non-Binary Yes %	Non-Binary No %
Medical	1	98.15%	1.85%	79.37%	20.63%
	2	96.3%	3.7%	100%	0%
	3	98.15%	1.85%	96.83%	3.17%
	4	100%	0%	93.65%	6.35%
	5	100%	0%	98.41%	1.59%
Social Media	1	90.32%	9.68%	49.25%	50.75%
	2	96.77%	3.23%	85.07%	14.93%
	3	90.32%	9.68%	82.09%	17.91%
	4	83.87%	16.13%	89.55%	10.45%
	5	87.1%	12.9%	89.55%	10.45%
Dating	1	84.91%	15.09%	21.95%	78.05%
	2	86.79%	13.21%	54.88%	45.12%
	3	90.57%	9.43%	71.95%	28.05%
	4	88.68%	11.32%	91.46%	8.54%
	5	96.23%	3.77%	90.24%	9.76%

Table 2. Percentage of participants that answered yes/no to the willingness to access questions.

In the Social Media context, a majority of the binary participants are willing to fill out the gender form to access a service across all five form options. Non-binary participants were more accepting to Options 2 through 5 than Option 1—50.75% of them would refuse to fill out Option 1 for a social media site. For Options 4 and 5, more binary participants than non-binary participants would not fill them out to access a social media site.

For the Dating context, the general acceptance toward all five form options still holds for binary participants, with the percentage saying no ranging from 3.77% to 15.09%. The form option that had the lowest acceptance among non-binary participants continues to be Option 1, with 78.05% of them refusing to fill it out. At the same time, 45.12% of non-binary participants rejected Option 2, compared to 17.91% for Social Media, and 0% for Healthcare contexts.

Whether participants found forms inclusive or exclusive, affirming or misgendering, and comfortable or uncomfortable correlated with whether participants would be willing to fill out the form to access a site or service. Many participants would rather opt out of a site or service if the input form was not inclusive—as long as this was a feasible option. For example, P-D18 described quitting an app that used Option 1 recently: *"Just this week I instantly deleted an app that asked that question. Even if I were male or female I wouldn't use an app that excluded my friends who are neither."*

Whether participants would refuse to access the site or service was additionally highly depended on how immediately relevant they deemed it. Some participants were willing to sacrifice comfort and inclusiveness if access was important or necessary to them. For example, P-S87 said, *"If I really wanted to access the site, I would just lie about my gender on the form."* They were prepared to "self-misgender" if the site or service was deemed valuable despite having incorrect gender markers. P-S69 reflected on their practices filling out forms in the wild: *"It was odd to reflect on how much misgendering I was willing to put up with for access to websites."*

4.5 Ranking the Options Across Contexts

Among binary participants, Option 4 (open-text box) received the most favourable votes in the Healthcare (50% of the votes) and the Social Media context (38.71% of the votes). In the Dating context, Option 5 (checkboxes) were preferred (43.4% of the votes). On the other hand, Option 1 (M/F) was seen the worst option across three contexts, with 64.81% of the votes in the Healthcare, 61.29% in the Social Media, and 77.36% in the Dating context. However, there were a small

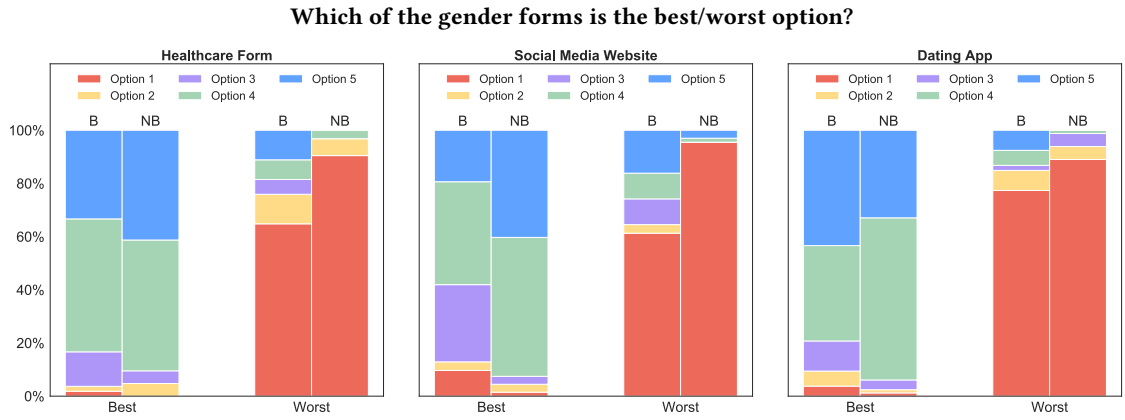


Fig. 4. Percentage of participants (B = binary; NB = non-binary) that chose different options as the best/worst option.

Best Form Options

Context	Option	Binary	Non-Binary
Medical	1	1.85%	0%
	2	1.85%	4.76%
	3	12.96%	4.76%
	4	50%	49.21%
	5	33.33%	41.27%
Social Media	1	9.68%	1.49%
	2	3.23%	2.99%
	3	29.03%	2.99%
	4	38.71%	52.24%
	5	19.35%	40.3%
Dating	1	3.77%	1.22%
	2	5.66%	1.22%
	3	11.32%	3.66%
	4	35.85%	60.98%
	5	43.4%	32.93%

Table 3. Percentage of participants that chose different options as the best option.

percentage of binary participants (2% of the 300 qualitative responses analyzed) who explicitly expressed anti-trans and anti-non-binary beliefs. For example, P-H31, who selected Option 1 in their survey responses, wrote *"There are only two genders, male and female."* However, the majority of binary participants did not express transphobic viewpoints.

Among non-binary participants, Option 4 was largely considered the best option in all three contexts (49.21% in Healthcare, 52.24% in Social Media, and 60.98% in Dating). Option 5 came as a close second for Healthcare (41.27% of the votes) and Social Media (40.3% of the votes). Similar to the result in binary participants, Option 1 is also deemed the worst option across all three contexts (90.48% in Healthcare, 95.52% in Social Media, and 89.02% in Dating). Figure 4 and Table 2 and 3 in supplementary materials show a detailed breakdown of participants' votes.

Worst Form Options			
Context	**Option**	**Binary**	**Non-Binary**
Medical	1	64.81%	90.48%
	2	11.11%	6.35%
	3	5.56%	0%
	4	7.41%	3.17%
	5	11.11%	0%
Social Media	1	61.29%	95.52%
	2	3.23%	0%
	3	9.68%	0%
	4	9.68%	1.49%
	5	16.13%	2.99%
Dating	1	77.36%	89.02%
	2	7.55%	4.88%
	3	1.89%	4.88%
	4	5.66%	1.22%
	5	7.55%	0%

Table 4. Percentage of participants that chose different options as the worst option.

Even when identifying a version that best matched their desire to express their gender, participants were not always satisfied with the exact presentation of the form. Particularly, the language of the forms was heavily contested. Many participants expressed distaste for the terms "male" and "female" overall and would prefer to see "man" and "woman."

P-H22 criticized the presentation of cisgender binary options as separate from transgender binary options on the form; they felt it implied that trans men were inherently different from men, and trans women were different from women. They wrote: *"Implying binary trans folk are not [male/female] matching ... brings up immediate anger/frustration."* Participants also expressed terms like "male-to-female" were *"outdated terminology many consider offensive"* (P-H28). One participant would prefer to see a two-step process: one for gender and/or pronouns and another for whether one is cis or trans.

Participants also questioned whether it was even appropriate to ask for gender as a *mandatory* field, particularly for Social Media and Healthcare contexts. Being troubled by the indicated necessity also seemed to coincide with less willingness to fill out the form at all. P-S70 asked of a Social Media website, *"Why do they need to know my gender identity? ... It's pointless to ask. It's offensive and annoying and intrusive."* Many participants felt similarly about Healthcare contexts, expressing *"doctors really just need to know a) details about anatomy and b) pronouns in order to provide adequate care"* (P-H21). Numerous participants expressed preferring a two-step process in medical settings that asked for pronouns and anatomical details, instead of gender.

For Dating contexts, though, participants seemed to be more willing to consider tradeoffs on more rigid categorisation. For example, P-D55 doubted the efficacy of an open text-box for the underlying matching algorithm featured in dating apps: *"While gender may not be crucial for a social networking app, in a context where gender is important, such as dating, having too many options or a free form text box could make matching impossible."* Some respondents were concerned about data integrity on social media websites, as well, others enjoyed that the open text-box would make it more difficult to collect data on users. For example, P-S73 wrote that Option 4 *"interferes with unnecessary data collection in a way I enjoy."*

5 HOW TO DESIGN GENDER INPUT FORMS

Much like previous work on gender inclusion [82, 89], we find there was no prescriptive universal approach to gender input forms. Rather, our qualitative findings showcase how the range of potential form options indicate different perceptions about inclusiveness, misgendering, and comfort for binary and non-binary individuals. However, our findings do indicate a larger consensus around which forms not to use. We identified a decreased willingness to engage with sites or services that employ exclusionary forms, causing a lack of trust or safety. Alongside this, participants expressed providing false information on forms that did not reflect their gender, resulting in misrepresentations, bad data, and active exclusion. While non-binary participants had more negative reaction to what they perceived to be exclusionary forms, binary participants also overwhelmingly expressed similar feelings, with some binary participants indicating they would not use services that excluded loved ones. In this section, we detail considerations when designing web forms, including whether gender is appropriate to ask, how context shapes how gender should be collected, and best practices for web forms which require gender. Recommendations are situated to our sample, which is primarily appropriate for English-language, Western contexts.

5.1 Alternatives to Asking about Gender

Asking for gender is not necessary in every context. While gender is often included by default, it is useful for designers to define what will be inferred from people's answers. For example, some participants suggested pronouns (together with anatomical information instead of gender) might be more relevant in a medical context, to improve the quality of care for patients; similarly, pronouns might be more useful than gender on social media, where pronouns are more applicable to the user experience (e.g., "Sarah commented on her post."). While being able to indicate multiplicities of gender could be useful on dating apps, embracing alternatives to explicitly asking for "gender" may be the most appropriate solution for many digital contexts. We would encourage designers to consider alternatives such as:

- Allowing people to indicate their *pronouns*.
- Asking for non-gendered information about relevant *anatomy* in a medical context.
- *Separately* from questions of gender, asking individuals to report trans, intersex, or cis status, if appropriate, while giving the option to opt out (e.g.,medical contexts where anatomical details or trans status is relevant to an individuals' care, or dating contexts where the individual wishes to be able to disclose).
- *Omitting* gender information entirely (e.g., pronouns, gender, and/or anatomy).

Figuring out how, and if, to design gendered input into systems starts with understanding the context in which gender is being used.

5.2 The Necessity of Context and Purpose

Participants were in relative agreement about which forms were best and which were worst—particularly within binary and non-binary groups. However, their decisions were often contextually dependant. Personal representation on social media, the articulation of gendered desire through dating apps, and seeking medical care were explicated differently in our qualitative data. Participants understood the need for detailed bodily information in some medical contexts, where something as personalized as a social media site might not even need gender tied to it at all.

Our findings highlight the need to deeply consider the context for gendered questions. Designers and researchers should reflect on how respondents might want to define gender given a particular purpose. To better exercise contextual consideration, we propose the following questions to designers to probe their gendered forms and databases:

- *What* do people using the system want to communicate about their gender?
- *How* would they prefer to communicate this information?
- For what *purpose* is communicating gender relevant to people engaging with the system?
- How would *others* with access to gender information react to or use it?

Assessing the needs and expectations of the intended audience of a service, whether through surveys or participatory design methods, might lead to more appropriate approaches to gender input forms. Cultural and historical context is another factor that designers must consider, as demonstrated in prior work on trans identities [92]. However, to ensure inclusion, it is critical to explicitly incorporate non-binary perspectives, who—as showcased in the related work and this study—are traditionally left out of gendered design decisions to the detriment of mental well-being and community-building.

5.3 More Inclusive and Context-Aware Gender Web Forms

We recommend designers avoid implementing binary options like Option 1 (see Figure 1), as previously argued by prior research (e.g., [11, 44]). Similarly, we recommend designers avoid othering language in their forms, as was seen in perceptions about Options 2 and 3 (e.g., using words like 'Other' or 'Something Else'), against prior recommendations in HCI (e.g., [44]) and beyond (e.g., [58]). We found that open text boxes, as seen in Option 4, was near universally perceived as the most inclusive form by non-binary participants, with the least misgendering effects across all contexts. However, the inclusiveness of Option 4 did not make it feasible in all contexts, a reality participants acknowledged. When Option 4 is not feasible given the purpose of the form (e.g., when a system utilizes desired algorithmic matching like in dating apps), designers should consider implementing Option 5, however, with some improvements to the language choices we identified through this study. Participants explained that terms for trans people like "Female-to-Male" and "Male-to-Female" are outdated, despite their use on "trans inclusive" forms [22, 28, 30], indicating that form designers need to attend to language in flux and the preferences of their intended populations. Similarly, participants disliked that trans people seemed to be called out as separate from cis people (e.g., "Female" and "Transgender Female" are separate). Some participants also disliked the seemingly "biological" focus of the words "male" and "female." Lastly, participants expressed dislike of "intersex" being treated as a gender, when it more adequately describes the biological makeup of an individual. One possible revision of Option 5 may look like the following:

- Woman / Female (Cis or Trans)
- Man / Male (Cis or Trans)
- Non-Binary
- My Gender is Not Listed Above: (Open Text Box)
- Unsure / Questioning
- Prefer Not to Answer

The above example addresses the concerns participants highlight, while still facilitating designs which rely on gender data. We recommend using multiple terms (e.g., woman / female) to best accommodate those with differing perspectives on the social and biological meaning of gendered labels, as seen in previous literature in trans studies (e.g., [14, 52, 86]) and perceptions in our data that indicated trans people should not be viewed as inherently different from cis people (e.g., P-H22 expressing distaste for *"Implying binary trans folk are not [male/female] matching"*). Only when it is relevant to the system should trans and cis status be collected. This can be done by asking a separate question, such as:

- Cis

- Trans
- Unsure / Questioning
- Prefer Not to Answer

Our findings, hence, empirically validate but also extend prior recommendations [89] derived from personal experience and assessments. We identified a need for including multiple terminologies and explicit signposting for trans inclusiveness within currently dominant web form ecologies. Further, we provide guidance on how to differentiate between cis and trans populations, should this be necessary.

However, in many cases, collecting gender data is not appropriate or requires more nuanced deliberations given the purpose of the product or service. We describe how to think through the appropriateness of gender in Section 6.

6 HOW WE SHOULD THINK ABOUT GENDER INPUT FORMS

As researchers and designers, it is imperative to the quality of our data as well as our societal mandate that individuals interacting with our interfaces feel included and recognized. Prior research has uncovered the detrimental affects of misgendering, often perpetrated by embracing cisgenderist approaches to designing forms and interactions [6, 45]. Other HCI researchers have already discussed this impact; specifically, the implications of binary gender dominance in surveys [44] and social media sign-up forms [11]. Our study augments this work by explicitly collecting perceptions about filling out such forms, from both a binary and non-binary perspectives and empirically validating as well as extending prior work [89]. In this section, we discuss insights on gender representation from our findings, from input form to data infrastructure, highlighting the highly relevant role context plays in making gendered design decisions.

6.1 Gender Representations at the Interface

In our participants' qualitative evaluation of gender input forms on the survey, they expressed knowledge of the design decisions forced upon them through gendered forms. Participants were aware, and pushed back against, gender representations they disagreed with, particularly representations they felt were exclusionary and offensive. In some cases, the form represented more to participants than a form: it challenged their notions of gender by, quite literally, encoding gender along different conceptualisations. Participants had to think about what to select or write, and what that meant to them, when filling out gendered forms. Further, the perceived inclusiveness, misgendering, and comfort of forms had consequences for whether participants indicated they would *access a specific service at all.*

Perhaps the most prominent theme throughout our data was the tension between *freedom* and *limitation.* Participants valued *agency* to make decisions about how to describe their gender when accessing digital services. The value of agency for trans individuals can be seen throughout numerous HCI works examining gender's relationship with technology (e.g., [34, 49]), yet the notion of self-description and fluid gender options is still absent from a great deal of technology design [11, 81]. Participants—both binary and non-binary— subsequently commented on how limiting binary forms were as well. This sense of limitation was accompanied by feelings of unease, of being "othered" by the system, through implicit (only being able to select "male" or "female") or explicit (having to select "other") means.

There has been a general lack of awareness in traditional systems and design papers of how we are ingraining "politics at the interface" [46]. We see this strongly playing out with gender, and so do users. Participants often commended Options 4 and 5 for their freedom, flexibility, and multiplicity (the ability to write or select more than one gender). Our findings further impress the need to explore alternative ways of conceptualizing gender input at the interface level,

across a variety of digital sites and services—and beyond. Given this, it is paramount for designers, researchers, and engineers to think deeply about the gendered input form—beyond the interface.

6.2 The Interface of Infrastructure

Gender representations extend beyond forms. Forms are just the user-facing component of a broad gendered ecosystem that extends into platform databases, data standards, infrastructures, policy, and even law [69]. In the case of social media, the gender provided by a web form might connected to the ways advertisers target members [11], leveraging a long history of gendered market segmentation. In the case of dating, gender has been used to determine how (and if) one is compatible with another. Developers of these apps often rely on the convenient bucketing that predefined gender categories provide. In the case of a doctor's office, one's gender might connect to how doctors provide their services (e.g., the standard procedures for a physical exam), to say nothing of if those services are authorized by insurance companies. Gender plays a central role when insurance authorizes what are traditionally sex-segregated treatments, like birth control or top surgery [4].

Gendered forms are a visible instantiation of deeply calcified standards that can be difficult to change. As gender inputs in forms lead to gendered representations in infrastructure, gender can become calcified, increasingly difficult to change. These challenges grow exponentially as the stakeholders that rely on (and code systems around) these data increase. Challenges exist for historical data as well: If a website were to change their gender options on a sign-up form from binary to an open text-box, how should they handle all of their current members who have already selected a binary gender using the previous form?

There are moments, however, where change is easier. While redesigning medicine to be more gender-inclusive will require coordination across a complex ecology of stakeholders, the barriers for social media, dating sites, or a new app without a user base can be much lower. Here we would encourage designers to resist any defaulting to a binary or to trivialize interface choices as simply cosmetic. When thinking about how to design inclusive web forms, it is also pressing to acknowledge how those forms link to underlying data and how this data is used. Reimagining ways to database gender—perhaps as strings, rather than through boolean logic—might alleviate issues of backwards compatibility as systems are updated.

The various interdependencies behind web forms are often invisible to the user, and it is likely that designers of gender input forms are often constrained by the underlying data and organizational standards. This can make it difficult for interface designers and front end developers to impact the larger structure of a system. However, our analysis highlights the risks of not adequately considering how gender is operationalized. Our participants articulated nuanced predictions about how their input might impact the subsequent experiences they would have. For example, participants were concerned about how their gender selection on a dating app might impact their safety; if they were trans but could not formally self-describe, people might react violently upon disclosure. In medical scenarios, participants were uneasy about how their responses might lead to poor treatment or lack of respect by medical officials—a sort of "human infrastructure" [55].

Whether due to inaccurate information, reputation risks for the organization, or people just refusing to use a system with an exclusionary web form, it is time for designers, and perhaps more crucially, engineers, to stop overlooking this staple of our digital lives and design web forms that let people tell systems who they are on their terms. Given the potential organizational and structural barriers that may prevent designers, researchers, and engineers from addressing

[4] "Top surgery" is a colloquial term trans individuals use to describe a gender affirmative procedure for the removal of breast tissue, often reported as a mastectomy through insurance companies and predicating the patient is listed as "female" on their insurance card [99].

changes to gender in a system, we encourage HCI as a field to engage in further conversation about empowering interface designers in making larger infrastructure changes.

7 FUTURE WORK

Future work offers an opportunity to expand on the limitations of the present study. We encourage researchers to focus on different cultural and regional contexts and/or to expand the scale of such work to include a more global sample. Similarly, we believe future work would benefit from other scenarios beyond healthcare, dating, and social media contexts. Further, we would encourage future research to study realistic *in situ* experiences with gendered web forms in different contexts.

8 CONCLUSION

Gender input forms both gate access to important and necessary services, and act as initial data entry points for layers of technical infrastructure. Thus, it is necessary that we interrogate how gender is constructed through web forms and who those web forms serve. Future work should investigate how gender input forms are perceived in further contexts and different cultures. Researchers will also need to revisit expectations about gender input forms regularly, as experiences and perceptions of gender change over time. Further research may focus on how gender input forms interconnect with infrastructures—including when forms influence databases, and vice versa.

To understand how both binary and non-binary people react to gender input forms, we created a survey to explore commonly used form options across three contexts: social media, healthcare, and dating. We found that all participants largely preferred flexible forms, like open text boxes and multi-checklists, while disliking binary "male or female" versions. We witnessed differences between binary and non-binary respondents' willingness to access services that used exclusive and uncomfortable options; non-binary individuals were less willing to engage with services that used exclusionary forms. Our findings inform a discussion of gender representation at the interface level and how that cascades into underlying data infrastructures.

We concluded with several design considerations for improving forms, and their associated databases, across different digital contexts. While we do not prescribe a universal solutions for inclusive gender input forms, we offer questions for assessing how gender should be addressed in different digital contexts. These recommendations point designers—and researchers—towards more thoughtful practices, meant to prioritize flexibility and agency.

A APPENDIX

Best Form Options

Context	Option	Binary	Non-Binary
Medical	1	1.85%	0%
	2	1.85%	4.76%
	3	12.96%	4.76%
	4	50%	49.21%
	5	33.33%	41.27%
Social Media	1	9.68%	1.49%
	2	3.23%	2.99%
	3	29.03%	2.99%
	4	38.71%	52.24%
	5	19.35%	40.3%
Dating	1	3.77%	1.22%
	2	5.66%	1.22%
	3	11.32%	3.66%
	4	35.85%	60.98%
	5	43.4%	32.93%

Table 5. Percentage of participants that chose different options as the best option.

Worst Form Options

Context	Option	Binary	Non-Binary
Medical	1	64.81%	90.48%
	2	11.11%	6.35%
	3	5.56%	0%
	4	7.41%	3.17%
	5	11.11%	0%
Social Media	1	61.29%	95.52%
	2	3.23%	0%
	3	9.68%	0%
	4	9.68%	1.49%
	5	16.13%	2.99%
Dating	1	77.36%	89.02%
	2	7.55%	4.88%
	3	1.89%	4.88%
	4	5.66%	1.22%
	5	7.55%	0%

Table 6. Percentage of participants that chose different options as the worst option.

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