

# Sociotechnical Imaginaries for Technical Design Workshop

CHI 2026

BRONTË RAPPS, Northumbria University, UK

## 1 Introduction and My Research

It is critical to incorporate responsible design in research to address social and societal challenges, particularly when investigating topics that cause harm, to gender and sexual minority individuals [4]. Considering the consequences of new technology, responsible design is indispensable to include marginalised voices in under researched areas [5]. With the growing rise of AI but lack of regulations, there are many concerns as to how this new technology will continue to perpetuate harms and stereotypical beliefs [7]. Directly relevant to these questions, the research that I will undertake in my PhD will use participatory design to address the question of whether AI exhibits heteronormative biases which exclude queer people, and therefore responsible design must be a central element of this project. My PhD research will be focused on language models, specifically how heteronormativity is perpetuated within these frameworks.

Heteronormativity shapes both the way we view others (i. e. make judgements about their gender/family), but also the way we perceive ourselves (e.g. gender dysphoria) [11]. Heteronormativity is both assumed standard in society, therefore those who do not align with or question normative ideology relating to gender, sexuality, and familiar structures can face backlash due to heteronormativity being deeply ingrained in society (Butler, 1990). The normalisation and perceived societal preference of heterosexuality leads to denial, rejection, and stigmatization of queer and nonbinary identities, harming those who do not fit within the gender and sexual binary [3]. My current PhD work is examining heteronormativity in literature and language models and the impact this has on queer individuals. Despite being only five months through my PhD, I have already conducted my first study examining whether queer individuals were able to identify and reflect on heteronormativity in language. This research utilised a design probe booklet, with fiction and nonfiction quotes from literature that depicted or discussed heteronormativity. I recruited 8 queer participants ( $M = 27$ ) via snowball sampling to take part in the study, and participants were provided with a design booklet that provided 7 fiction and non-fiction quotes relating to heteronormativity. Three probes were provided to explore their initial thoughts, discuss heteronormative language in text, and how they can utilise the quote to reflect on their own perceptions. The research was then analysed using a Conceptual Thematic Analysis [8]. Themes of Social Representation and Emotional Impact were discovered and are being shaped into a conceptual model. Social Representation was identified to have themes of perpetuation and hierarchical, and Emotional Impact was found to have themes of resignation and despair. This model was informed by Hegemonic Heteronormativity, that discusses the intersection of Sexualities, Gender, and Family as well as the impact of race, class, ability, ethnicity, and nationality on heteronormativity [1]. The model includes the two themes, and the way understanding, recognition, and awareness all have levels of identification relating to societal representations. This then links to the theme of emotional impact, with predominantly negative emotions present, to demonstrate how heteronormative social representations can influence emotions experienced. This model can aid in ways to identify influences of heteronormativity and its potential impact on people. A zine is being created to provide a visual artefact and engaging response to the findings, as an alternate and accessible way to promote engagement and understanding within research. It is essential to have this foundational design elements to begin the project and to have participants' perceptions included early in the work.

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Author's Contact Information: Brontë Rapps, b.rapps@northumbria.ac.uk, Northumbria University, Newcastle Upon Tyne, UK.

Manuscript submitted to ACM

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My next PhD study will examine word embeddings relating to heteronormativity in language model, by examining datasets such as GloVe and fast text on which most AI LLMs are trained [9],[6]. Language models are thought to perpetuate and further amplify existing heteronormative bias due to existing structural and systemic inequalities (especially those that exist in online spaces) in the training data [12]. This research is supported by Caliskan and colleagues' [2] work on Gender Bias in Language Models, finding significant evidence of gender biased data within large text corpora. The purpose of my work is to provide a continuation and extension of this research by also examining sexuality and the concept of nuclear families. To conduct this analysis, I am currently examining literature relating to heteronormativity to determine which words/word pairs to utilise due to the complex nature of this topic which spans all levels of society (i. e. individual, family, social groups, legal, governmental).

Conceptually there have been a few obstacles within this research, such as refining and investigating complex and multiple elements that contribute to heteronormativity, and how to apply this within language models. I am further interested in how to ensure that the work I am doing will be beneficial for queer participants. Following the foundational elements of the PhD, I intend to conduct workshops with queer individuals to develop resources that would be most beneficial to them. This could be materials to detect heteronormativity, or resources to learn more about AI systems and its ingrained bias. The project also aims to incorporate participatory and responsible design to improve safety and understanding from those most impacted by gender and sexuality-based harms online. Intersection and community-led participatory design are essential for queering AI systems and online interactions [10]. In conducting responsible design with marginalised groups, it is important that there is constant engagement and reflection to produce work that is reflective of the needs of the LGBTQ+ community by listening to their voices and working alongside them to produce mutually beneficial outcomes.

Although my PhD will continue to grow my skills in responsible design, I do have previous experience on the topics of the LGBTQ+ community and design. I taught on the course Psychology of Intimacy where I presented a lecture on LGBTQ+ relationships and how this differs from heteronormative ones. The lecture focused on inclusivity within various relationship types. For my Master of Research thesis, I conducted research on bi+ and trans victimisation, discrimination, and wellbeing. The research found that only social support positively impacted wellbeing. This research taught me ways to engage with the LGBTQ+ community, ways to effectively and safely explore sensitive topics, as well as advanced statistical coding. I have also worked as a research assistant on research projects relating to LGBTQ+ Intimate Partner Violence, Visual Sexism in AI, and LGBTQ+ social networks, the impact of families of choice, outness, and emotional closeness. These research projects used both qualitative and quantitative research methods in which I collected and analysed data, wrote up reports, and were inclusive of community engagement to disseminate research findings. Furthermore, as part of my training within the Citizen-Centred AI Centre for Doctoral Training, I undertook several design modules relating to interactive and physical design, that helped to expand my knowledge on responsible design and various implementation methods.

## 2 Conclusion

This workshop would provide me with the valuable opportunity to reflect on my past knowledge and experience and further my understanding of responsible design to implement it and critical reflection on gender and sexual minorities more fully into my PhD project. I also look forward to advancing my knowledge and understanding of imaginaries and responsible design provided by Dr. Min Zhang and other respected and knowledgeable researchers within the field. I hope you will agree that my knowledge about gender-based harms online and my experience implementing design principles in my research will contribute to the richness of discussions and participatory activities in this workshop.

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