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The aesthetics of agency: generative design research in developing latent knowledge on care identity and lens-based technologies.

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This paper addresses gaps in understanding concerning the process and practice of knowledge and theory development in generative design research. Drawing on feminist scholarship, the research explores agential relationships between young people with lived experiences of care and lens-based technologies. The theoretical position was inspired by the habits of mind of filmmaker Jean Rouch. The paper foregrounds the trauma-informed research design and resulting digital artefacts towards developing a novel generative framework. The artefacts were co-created during trauma-informed Research through Design workshops with the care experienced young people. The collaborative workshops enacted generative design research techniques as relational ways of being and knowing at the intersections of Applied Theatre and Human-Computer Interaction. This syncretism elicited novel somatic meaning-making modalities of experience with the participants and lens-based technologies. The outcomes provide an understanding of trauma-informed design research focusing on latent phenomena, expanding the repertoire of generative design research processes, practices, and theory.

Keywords: Augmented Reality, trauma-informed-RtD, HCI, Applied Theatre, Care identity

1. Introduction

Sanders' (1999) model of user experience in participatory design research categorised knowledge domains into explicit, observable, tacit, and latent. While generative design research techniques that address the latent knowledge domain have evolved over the past two decades, gaps remain in our understanding of the generative design process itself, particularly in transdisciplinary and trauma-sensitive contexts with the integration of lens-based technologies.

To address these gaps, the purpose of this pure qualitative study is to extend our understanding of the factors that influence the development and implementation of generative design research with stigmatised communities, such as individuals with lived experiences of care. By delving into the interplay between design research, lens-based technologies, and the complexities of trauma-

sensitive contexts with care experienced young people, this study contributes to a more comprehensive understanding of generative design research. Attending to these gaps is important for building bridges in knowledge production and theory development towards more inclusive design research practices, which can:

- Support methodological pluralism by complimenting design research that focuses on explicit, observable knowledge domains.
- Addresses trauma-sensitive challenges of participation and representation of stigmatised communities.
- Expand the boundaries and repertoire of generative techniques with digital media as material in the process and practice of meaning-making.

The practice research is responsive to these gaps towards developing a generative theoretical framework scaffolded on the recovery of pioneering filmmaker and ethnologist Jean Rouch's (1917-2003) praxis, developed on philosophical foundations of agential realism (Barad, 2007). The synthesis of Rouch with an agential realist stance provides a novel way to investigate and communicate the performative, dynamic and plural nature of co-constituted latent phenomena — knowledge of both the human participants and lens-based technologies yet to come into being. Specifically, the research focuses on meaning-making activities with care experience communities and lens-based technologies, such as augmented reality.

Central to the study are the entangled notions of uncertainty and agency, which permeate the interconnected domains of the research. The paper foregrounds the generative design process and outcomes as interactive augmented reality artefacts. These co-created digital artefacts came into being through attunement to what the participants with care experience made, improvised and dreamed. This fieldwork was enacted as trauma-informed research through design (RtD) workshops that unfolded over three weeks with young people from Edinburgh Council's Champions Board.

1.1 Programs and Experiments

Applications of this trauma-informed design approach are explored as a pure research project that aims to generate knowledge for building a broader understanding of the 'how' of design research with lens-based technologies. This orientation qualitatively sets it apart from typical applied user-centred service design research. In this regard, Redström's concept of 'program' and 'experiments' offers a useful framing for this distinction.

Redström (2017) frames the design 'program' not as a rigid blueprint but as a flexible guide that can be adapted and refined as the design research progresses. It is attentive to the iterative, cyclical explorations, which are crucial for the generative and emergent nature of this research. The 'program' lays out the context and parameters within which individual design experiments unfold. Although these design experiments transpire within applied design practice, their primary objective is not to solve specific design problems but to generate new understanding and design theories. Experiments achieve this by enabling designers to test and obtain feedback on innovative concepts within a real-world context, an approach which aligns with research through design's (RtD) objective of knowledge production about the design process itself.

The implementation of the 'program' in my research is depicted through three sequential and interconnected fieldwork 'experiments'. These experiments as cycles of trauma-informed RtD workshops are united by overarching objectives that focus on the experience of producing knowledge about the 'how' of the design process and digital material practice of new design theories

and methodologies. The paper reports primarily on the second experiment of data generation, analysis, interpretation, and representation, addressed through the following research questions:

1.2 Research Questions

RQ1: What emergent factors shape the performative process and material practice of interpretive theory development in trauma-sensitive generative design research?

- How do these factors manifest in design research with care experienced communities?
- What roles do lens-based technologies play in this dynamic and performative process?

The primary objectives for the research program being addressed are:

- Understanding how lens-based technologies can participate in trauma-sensitive generative meaning-making activities concerning latent phenomena with care experienced communities.
- Exploring the potential of these technologies to document, codify and communicate the process and practice of trauma-sensitive RtD, from data generation to analysis, interpretation, and representation.

By examining these questions, the paper contributes knowledge on trauma-informed extensions to research through design (RtD) towards a generative theoretical framework for participatory meaning-making with stigmatised communities utilising lens-based technologies.

1.3 Paper Outline

To contextualise the research gap and purpose, the paper starts by providing a background on generative design research, discussing Sanders' (1999) model for participative experience-centred design. It continues to provide an overview of care identity, ethics and trauma-informed principles before progressing to discuss considerations for the emergent generative theoretical framework, synthesising ideas from Jean Rouch's ethnofiction praxis and research philosophy of Karen Barad's agential realism. The methodological section integrates RtD as a mode of trauma-informed inquiry for theory development. A high-level summary from the second cycle of fieldwork highlights the trauma-sensitive, playful participative process and material practice of developing digital artefacts as research data. Finally, the paper concludes by communicating potential future directions by exploring affective and collaborative meaning-making opportunities through the presentation of interactive digital artefacts as a means of emotionally communicating latent insights from the practice research data with audiences.

2. Generative Design Research

In response to the experience and participatory turn in design, Sanders (1999) conceptualised a model for accessing a fuller, more holistic and textured range of users' experiences. According to her model, knowledge can be divided into four dimensions: explicit, observable, tacit, and latent (Figure 1). She posits that explicit and observable knowledge can be accessed through conventional qualitative design research methods such as interviews and observation. However, tacit knowledge, which can't readily be expressed in words, is less easily elicited. Latent knowledge is even more deeply hidden, consisting of abstract values, dreams, and emotions that individuals may not yet consciously recognise. People have difficulties expressing their future values verbally, and, as such, they are largely ineffable to traditional methods. Latent knowledge, because it is mutable and not readily accessible or articulated, is imbued with uncertainty but can come into being through

generative techniques that are dynamically attentive to what participants make, improvise, and dream, particularly in relation to speculative actions and experiences, which can give form to these subliminal currents of thought and understanding.
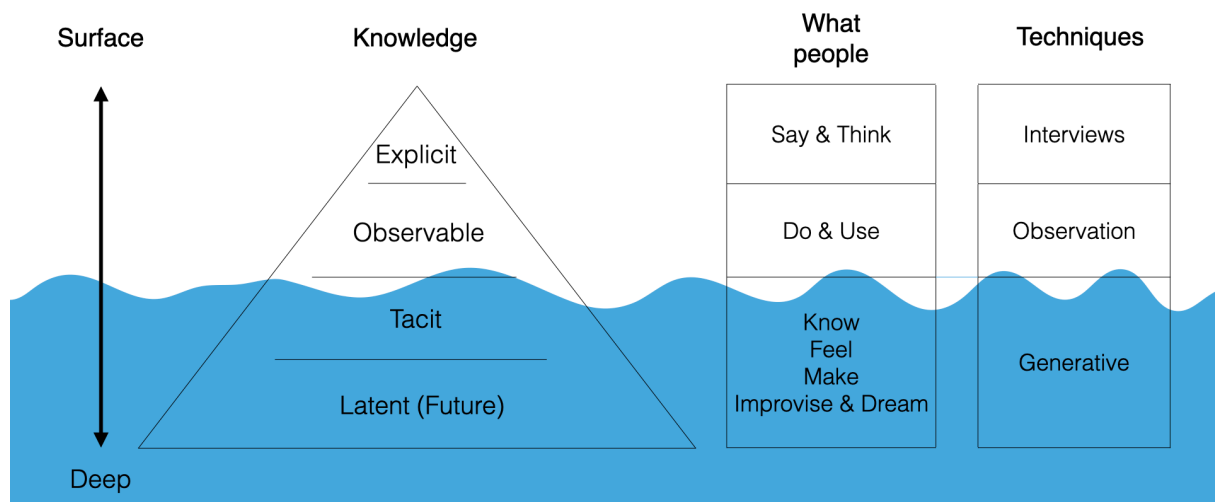

Figure 1. Types of knowledge and how we acquire them. Inspired by a figure in (Sanders & Stappers, 2020, p.67).

Sanders developed toolkits to use in experienced-centred participatory design research to illuminate users' thoughts, feelings and dreams in relation to product or service designs. These toolkits encouraged creative expression through diverse making practices and became known as generative design research techniques (Sanders & Stappers, 2008). Her model also demonstrates the importance of methodological pluralism by drawing on multiple knowledge domains to build a more comprehensive picture of human experience in the participative design of products and services.

Over the past two decades, generative design research has evolved through diverse product and service design applications (Sanders & Stappers, 2020). Despite these well-documented case studies, a paucity of knowledge exists on how generative design research principles can be applied in:

1. Knowledge production about the design research process itself.
2. Meaning-making activities within trauma-sensitive contexts, with stigmatised communities such as those with care experience.
3. Understanding how latent knowledge is brought into being during theory development in transdisciplinary research incorporating emergent lens-based technologies such as augmented reality.

This research aims to address these gaps, emphasising the co-constitution of latent knowledge in the context of human and non-human interactions for broadening our understanding of generative design research and its applications in transdisciplinary research and theory construction. The framework focuses on embracing and being well with uncertainty as an inherent characteristic of agency and the unfixed, emergent nature of latent knowledge.

The application of generative design in this research focuses on playful and speculative approaches and methods for collaboratively and reflexively navigating uncertainty. Generative techniques can be characterised by two dimensions of the creative research practice. Firstly, as a mindset when engaging with care experienced communities through a process of active listening and attunement, collectively generating topics for exploration rather than hypothesis testing. Secondly, as tactics in how knowledge is generated on latent aspects of social and technical phenomena.

3. Care Identity and Trauma-informed Design

Care experience is a term used to describe a person currently in care or with a looked-after background. The vast majority of people enter the care system in the UK for a need of care and protection. However, media narratives enforce a stigmatising and fatalistic deficit discourse on care identity, which can become embedded in the public's psyche (Each and Every Child, 2020).

Troubling this narrative of care experience, the research embraces and celebrates creative expression and the exercise of agency as critical components in exploring and re-framing an understanding of care identity. Detailed discussions on applied findings are beyond this study's primary focus on understanding generative knowledge construction processes. However, future applied research could strengthen the bridge between research understanding, theory development and broader practical applications.

Grounded in fundamental ethical good practice, this study is designed with care and consideration for the participants and stakeholders involved, particularly in trauma sensitivity and attunement to care identity. Adherence to confidentiality, informed consent, and the right to withdraw is enacted throughout. Building upon this baseline, the study draws on emancipatory principles of Rouch's praxis.

Given the tendency of individuals with care experience to have imposed framings, a key starting point for my workshops was the co-creation of safe and brave spaces for dialogues and creative expression (Arao & Clemens 2013). Fundamental to this endeavour is an emphasis on trauma-informed practice, recognising the agency of individuals in shaping their own narratives and representations throughout the data generation, analysis, interpretation, and representation processes.

Being responsive to Scotland's ambition of becoming a trauma-informed nation (Scottish Gov., 2021), this research emphasises the importance of trauma-sensitive approaches when engaging with care-experienced communities and extends the practices of RtD. Recognising the existence and varied impacts of trauma on individuals, the research acknowledges the shared experiences of adversity faced by care-experienced individuals, including separation from family and navigating high levels of change and uncertainty. The five key principles derived from the Trauma-Informed Practice Toolkit Scotland, of safety, trustworthiness, choice, collaboration and empowerment, serve as a basis for discussions of the RtD fieldwork findings.

Methodologically, this inquiry adheres to Connell et al.'s (1997) universal design principles by focusing on trauma sensitivity in RtD practices. This emphasis addresses being attentive to the needs of stigmatised communities to create a more holistic and comprehensive understanding of our ethical responsibilities, which can inform and enhance the rigour of design research and theory.

4. Research Design

This section outlines the emergent theoretical framework, underpinning research philosophy and methodology for operationalising the research questions and addressing objectives. The inquiry's trauma-sensitive and post-humanist stance, which acknowledges reality as co-constituted and emerging through entangled human and machine agencies, seeks a framework to address these complex interrelationships. Existing frameworks may fall short of capturing these nuances, underscoring the need for a more tailored approach. The research is scaffolded on core tenets from Jean Rouch's ethnofiction praxis (Rouch & Feld, 2003) developed on the philosophical foundations of Karen Barad's agential realism (Barad, 2003).

4.1 Rouch <–> Barad

Representationalism, rooted in the distinction between the knower and the known, underlies the ontologies and epistemologies of both scientific realism and social constructivism (Barad, 2003), prevalent worldviews in design research. This study, however, emphasises the co-constitution of latent knowledge emerging from agential relationships among generative design research stakeholders, care-experienced communities, lens-based technologies and environments. The emergent nature and focus on care identity in this research necessitate a flexible and adaptive theoretical approach, which avoids imposing framings and can accommodate evolving insights throughout the creative and participatory process of interpretive understanding.

Rouch's ethnofiction combines elements of documentary filmmaking, anthropology, and fictional narrative to create a new form of participating, knowing and representing cultures. Ethnofiction films offer textured and nuanced insights into participants' latent values and aspirations, facilitated by the playful, participatory, speculative, and reflective processes of their creation. Firstly, this is evident in how fictional representations of the participants were collaboratively developed through 'cine-trance', a technique involving projected improvised performances of their values and their aspirations for the future. Then collectively interpreted and shared in group 'screen-back' sessions, where the participants could reflect on the experience, re-encode meaning through recording audio voice-overs and influencing how they were being represented in the edit (Rouch & Feld, 2003; Sjöberg, 2008).

From Rouch's perspective, the 16mm camera was a vital component of the creative endeavour, possessing a special kind of agency manifest through its relational ability to provoke collaborative creative expression and cultural comprehension. The participatory and playful nature of ethnofiction created new avenues for participants to influence how they individually and collectively perceive and communicate speculative identities. The experience also had reciprocal emancipatory qualities, nurtured by the exchange of cultural experiences, the development of new film production and research skills, alongside the cultivation of individual talents. Apparent limitations of Rouch's 16mm camera, such as the lack of synchronous sound and needing to wind it up every twenty seconds, were embraced as characteristics that led to involving the participants in the 'screen-back' events to record voiceovers and self-reflexivity for Rouch every time was required to prime the camera for filming.

In this research, Rouch's ethnofiction principles are reimagined as a mindset and applied philosophy, serving initially as a design heuristic for guiding the process of generative design when engaging with care-experienced communities. An approach where participants can actively explore multiple, speculative representations of latent aspects of their experiences and cultivate new skills while simultaneously developing an understanding of the lens-based technologies' latent capabilities for meaning-making (Morrison, 2019).

Agential realism is a philosophical concept proposed by Karen Barad in their 2003 essay "Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter". Barad (2003) emphasises the performative nature of mattering and the entanglement of human and non-human actors in the ongoing production of knowledge and meaning. This position challenges the notion of fixed boundaries between subjects and objects and recognises that meaning-making is a dynamic and relational process. Barad foregrounds the notion that agency does not pre-exist but rather emerges through the dynamic 'intra-actions' between different entities, including technologies.

Drawing upon both Rouch's and Barad's notions that the camera is more than a mere tool to facilitate human action, reframes lens-based technologies as active contributors in the co-production of meaning and knowledge. This queering of the instrumentalist understanding of technology challenges views of human intentionality or reflexivity as prerequisites for agency. lens-based technologies in this research actively contribute to the unfolding of phenomena in their unique ways, manifesting their 'agential capacity' within the dynamics of these intra-actions. In this sense, lens-based technologies can influence how events are framed, perceived, and interpreted, co-shaping the practices they are involved in.

This acknowledgement of entangled agency informs the development of the nascent interpretive framework for generative design research that emphasises the interconnectedness of human, lens-based technologies and the environment. This approach underscores the situated, speculative and dynamic nature of knowledge and meaning-making, acknowledging the co-constituted nature of agency as something that is exercised rather than possessed. Furthermore, it emphasises an understanding of the necessity of uncertainty to agency, alongside the importance of considering the specific social and cultural context in shaping our understanding of latent phenomena.

4.2 Methodology

Karen Barad's agential realism provides coherent philosophical foundations for the research. Their notion of ethico-onto-epistem-ology describes the inseparability of ethics, ontology and epistemology when engaging in knowledge production (Barad, 2007). In line with the creative endeavour, this conceptualisation emphasises agency with human and non-human entities in constructing knowledge. It posits that knowledge is co-constructed, generative, relational, processual, and situated, tenets resonant to research through design (RtD).

Building on the agential realist philosophical foundations, the methodology is expressed as an explanation and justification of the practice. As a methodology, RtD aligns well with the agential realist worldview of this study due to its emphasis on co-creation and generativity. Cross (2011), described RtD as a hands-on way to materialise and express knowledge gained through 'designerly' ways of being and knowing. RtD, positioning design as a form of inquiry that contributes to knowledge beyond product and service design (Frayling,1993), is well suited to situations of uncertainty and complex, speculative and performative ways of knowing essential in this research. However, RtD methodologies could be enriched by greater attention to trauma sensitivity, thereby enhancing our understanding of the entanglements and agencies in a more-than-human world.

4.3 Epistemic Design Artefacts

Hans-Jörg Rheinberger introduces the concept of 'epistemic things' to describe the transformative and uncertain nature of objects in scientific research (Rheinberger, 1997). These things continually reveal new aspects of themselves through experimental activity. Barad (2007) extends this idea by emphasising the inseparable relationship between knowledge and materiality, highlighting the entanglement of human and non-human elements in knowledge production. In line with these perspectives, the co-created outcomes of this research are described as 'epistemic artefacts'.

5. Trauma-informed RtD Workshops

"Play delights in uncertainty" Alex Dunedin.

This section of the paper addresses the research objective of exploring how lens-based technologies can facilitate trauma-sensitive generative meaning-making activities within care-experienced communities. Drawing on my background in design, HCI, and lens-based practice, I engaged with care-experienced young individuals from the Edinburgh Champions Board in trauma-informed RtD sessions. Spanning three weeks, these sessions promoted active participation during data collection and interpretation.

I hoped that by recasting ethnofiction as a trauma-sensitive generative heuristic, we could develop safe and brave spaces for the exploration and expression of latent realities and values (Arao & Clemens 2013). In line with the trauma-sensitive nature of this research, to safeguard confidentiality and avoid re-traumatisation, rather than the participants playing themselves, we spent some time developing fictional persona characters. These personas represented a composite of lived experiences and were embodied by the participants and actors in ethnofiction activities to express experiences while creating 'distance' from personal stories.

The three participants defined the personas, names, ages, and what kind of care experience they had. To further develop the personas in the context of a scenario, we appropriated an empathy map template from designer Dave Gray, commonly used in HCI (See Figure 2). The empathy maps were drawn on A1 paper, and the participants decided to focus the scenarios on their persona's past experiences of care systems. See Table 1 for the empathy map activity in relation to the five key principles of the Trauma-Informed Practice Toolkit Scotland.
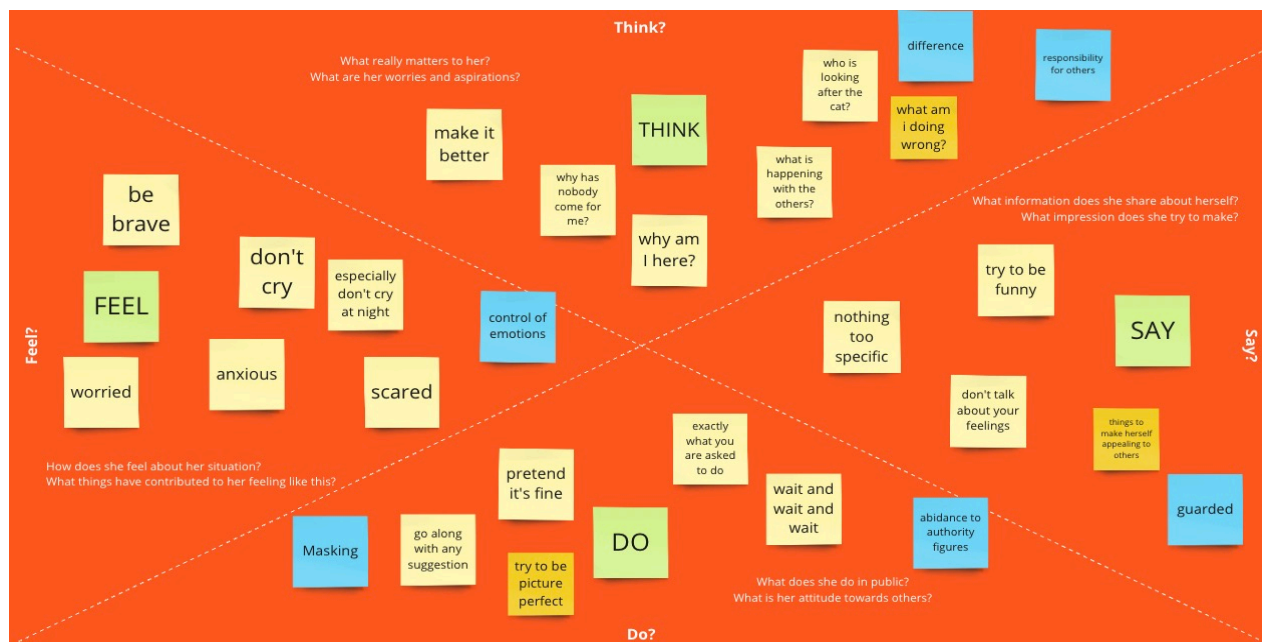

Figure 2 Example of digitised empathy map used during a visual coding process in the analysis and interpretation of data.

Table 1. Empathy maps in relation to the five Key Principles of the Trauma-Informed Practice Toolkit Scotland

Empathy maps in relation to the five Key Principles of the Trauma-Informed Practice Toolkit Scotland
1. Safety: The fictional layer of the empathy maps provided a visual and interactive tool for the participants to express their experiences and emotions safely. Safeguarding confidentiality opened up a creative way to explore and express complex feelings and situations while knowing their privacy is being respected. The activity facilitated a form of 'distancing', a therapeutic technique of creating emotional space or separation between the persona and the participant's personal experiences or situations, thus reducing the risk of re-traumatisation or overwhelming emotional reactions.
2. Trustworthiness: The process of creating empathy maps with the participants promoted transparency. By engaging in discussions about what the personas might say, think, do, and feel, in a non-judgmental way, we established a brave space for shared understanding which nurtured trust within the group.
3. Choice: This Is a central aspect of trauma-informed practice. Empathy mapping is inherently participant-led. Their personas' narrative representations within a scenario were determined by the participants, giving them control over what to and what not to include.
4. Collaboration: The empathy mapping exercise was collaborative by design. Participants worked together around the table configuration, to develop a deeper understanding of the personas, promoting mutual respect and understanding.
5. Empowerment: A tricky word in relation to the values, attitude and stance of this research that recognises power as exercised rather than possessed. However, the empathy maps provided an opportunity to identify and highlight the strengths or potential triggers for the personas. The participants recognising these strengths and triggers within their personas can encourage them to understand their own self-efficacy and agential capacity better. The third-person perspective can support a metacognitive awareness of the stimulus-response process that hypervigilance has on their character and thereby better recognise the mechanics of this within themselves.

"The performative you is a you you don't yet know. What are truth and identity if not dynamic?" Professor John Stuart Marlow.

The participants embodied the persona characters, enacting improvised projections of speculative scenarios as image theatre. These scenarios focused on concepts such as being heard and how uncertainty feels. Boal (1979) describes Image theatre as an embodied experience, which today can be identified in aspects of applied theatre and somaesthetic interaction design research (Hook, 2018; Stuart & Thompson, 2020). In this activity, participants improvised poses, creating freeze-frames with their bodies to explore latent emotional and symbolic associations of words, values or social interactions. Boal (2006) used a variety of playful improvisation (the art of yes and) techniques, including image theatre, to facilitate 'Mataxis'. This was a term that he used to describe the process of changing perspectives or "stepping into someone else's shoes." It refers to the ability of an individual to assume different points of view and understand an experience from multiple perspectives (Boal, 1979, p.9). This creative participatory activity and the resulting digital artefacts evoked embodied reflexivity and mataxis among the participants, where they could appreciate multiple subjective perspectives on the same shared social phenomena.

5.1 Data physicalisation

Enacting the principle of collaboratively 'making' rather than the researcher 'taking' images, and in collaboration with actors to protect confidentiality, the image theatre statues were recorded by a

participant using a volumetric camera, resulting in 3D digital epistemic artefacts (figure 3). The raw data from the sculptural images are point clouds that form spatiotemporal representations of the experience, creating media for dialogue, meaning-making, reflexivity and novel data communication with audiences. These epistemic artefacts represent prototypes with digital media as material containing codifications of understanding about participants' speculative enactments. Presenting them as point clouds preserves the fidelity of the original data while creating a layer of abstraction for addressing confidentiality.
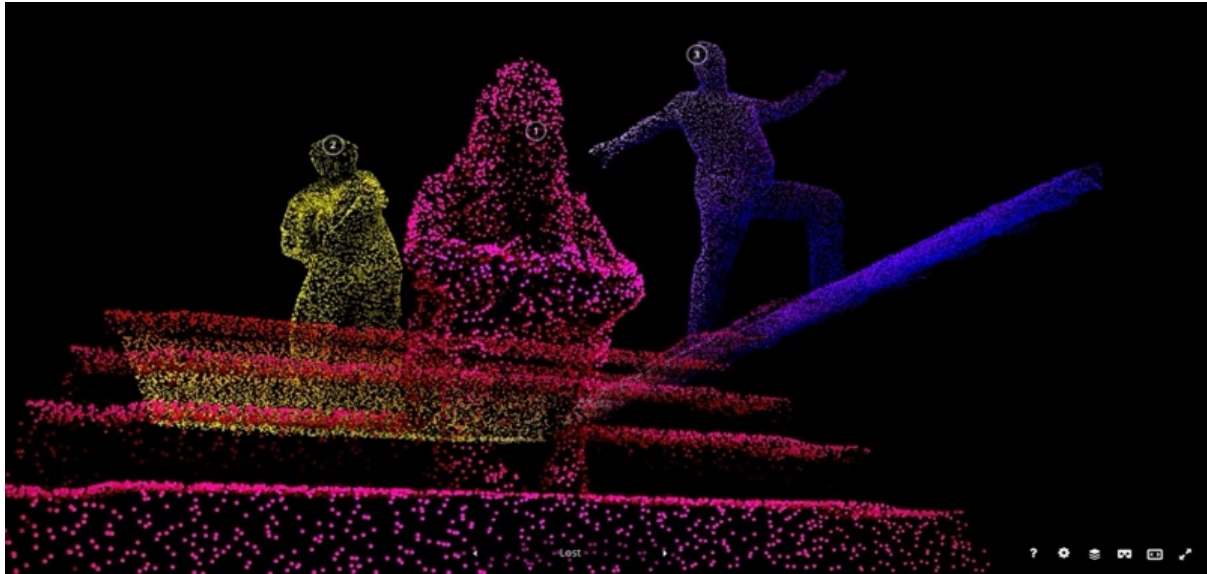

Figure 3: Screen capture of digital artefacts captured from mage theatre activities, conducted during RtD workshop with care experienced young people. Available with verbatim audio in an interactive form at http://liminalstudios.xyz/sketchfab

5.2 Collaborative data analysis

"Prototypes are not just about crafting artefacts; they inherently craft interactions between people. Prototypes are as much media for human interaction as technical effect." Michael Schrage

To enhance qualitative rigour, the artefacts offer novel ways of engaging in member checking. This is in alignment with Barad's definition of epistemic artefacts as always in relation to other agents, emphasising the co-constitutive and entangled nature of latent knowledge. Rouch used the term 'screen back' for attending to participants' agency in influencing edits of the emergent ethnofiction films. Through improvised voiceovers, suggestions for editing and future topics, participants at these events re-encoded meaning, reflexively shaping their representation.

Evoking Rouch's screen-back events, the AR prototypes present an opportunity for listening and feedback towards a research process where participants can become authors of their own narratives and representation. Feedback was invited by appropriating aspects of a think-aloud protocol. Think-aloud was selected as a flexible, reflective, evaluative method congruent to the generative values of the inquiry, which can surface textured, tacit, and latent aspects of both social and technical phenomena (Van Someren, Barnard, & Sandberg, 1994).

To preserve the confidentiality of the participants in the presentation of the think-aloud data, we employed verbatim audio techniques. Key snippets of the think-aloud recordings are listened to and re-recorded by other participants or actors. A process which facilitated the authentic word-for-word and emotional texture of the original reflexive accounts to be included in the presentation of the digital artefacts. An example of one of the epistemic artefacts containing verbatim audio recordings in an interactive form is available at http://liminalstudios.xyz/sketchfab

5.3 Future Innovations and Development

In the future, the goal is to develop and document further the reflexive process and material praxis of co-creating digital epistemic artefacts towards a trauma-informed generative design framework. Presenting the artefacts as interactive prototype experiences for affectively communicating to audiences how key emotional themes like stigma feel from the perspective of the people creating them. Contributing knowledge on the embodied representation of somatic qualitative data for exploring the potential of affective and collaborative meaning-making through extended reality (XR) technologies.

6. Conclusion

This paper has presented an exploration of the aesthetics of agency through the lens of generative design research, centred around the development of an emergent Interpretive framework. The research recovers key drivers from the creative praxis of pioneering filmmaker Jean Rouch (Sjöberg, 2008), scaffolded on principles of Karen Barad's agential realism (Barad, 2003). This syncretism has illumined insights into the co-constituted and entangled agencies of human and non-human actors throughout data generation, analysis, interpretation, and representation. The research focuses on developing a trauma-informed approach to interpretive theory development for generative design research, which emphasises understanding and meaning-making rather than an explanation of causal variables. By focusing on factors that shape the experience of latent knowledge construction, this approach can be enacted by other design researchers interested in better understanding the ways in which stigmatised communities create and share knowledge through their intra-actions and experiences with lens-based technologies.

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