

Modes of Relatedness with Intelligent Technologies

Reconfiguring the Relationship with Technology through the
Study of Props in the Films of Stanley Kubrick.

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Nicolas Jacques William Marechal

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Note. [Photograph]. Modine, M. (2005). *Full Metal Jacket Diary*. Rugged Land [Author's collection].

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I. Research Abstract

This research is situated within the field of interaction design, functioning both as a design study and, through an exploration of the combined analysis of film props and intelligent technologies, a demonstration that these two categories of objects share more commonalities than previously recognised. In particular, props offer valuable insights for rethinking the design of intelligent technologies, highlighting the importance of their performative and relational dimensions. One prevailing challenge with intelligent technologies lies in their carefully engineered yet often opaque development processes, which obscure the full ramifications of their societal impact. Examining technology through the lens of props offers a novel perspective that foregrounds the consequences of its use, and its entanglement within situated practices. This approach brings together critical perspectives from design and methodologies from science and technology studies, offering an alternative framework for understanding and engaging with intelligent technologies.

Interaction design has traditionally functioned as an intermediary between people and machines, aiming to enhance usability, efficiency, enjoyment or accessibility. However, it often remains limited to the immediate interaction, falling short of engaging with the broader implications of technological systems. This narrow focus tends to overlook the agency of intelligent technology for its capacity to influence human behaviour and social structures at larger scales. Films offers a unique laboratory for exploring the fragility of the relationship between humans and their tools, revealing processes of instrumentalisation both on screen and on set. By studying technological props, I propose that intelligent technologies should be understood as integral elements in a wider chain of relations involving humans, non-humans, and other machines. This perspective forms the basis of what I conceptualise as technological relatedness. The thesis argues that interactive objects operate not only at the level of individual interaction but also at a social level, drawing on Bruno Latour's (1992) theory of mediation, to reveal how technology both mediates action and participates in the shaping of social realities.

This thesis is organised into five case studies, each focusing on a technological prop scripted into the films of Stanley Kubrick. What distinguishes the selected objects is not only their active role within the narrative but also their capacity to exert influence—either within the film, on the set, or across both domains. The cases are treated as opportunities

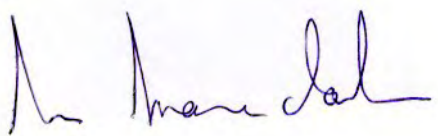
to examine the mediating roles of props. In the first phase, each prop is analysed through the framework of actor–network theory in order to construct a new narrative centred on relationality. In the second phase, they are compared with other props through their ability to solve social issues in films. In the final phase, they are reconfigured through the concept of technological relatedness. The objects are **Private Pyle’s M14 rifle** (*Full Metal Jacket*, 1987), the **Ludovico Treatment** (*A Clockwork Orange*, 1971), **Dr Strangelove’s glove** (*Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb*, 1964), **HAL 9000** (*2001: A Space Odyssey*, 1968), and **David and Gigolo Joe** (*A.I. Artificial Intelligence*, 2001). The chapters are organised according to the degree of mechanisation of the human, progressing from low to high, and concluding with an analysis of the humanness of machines as a mirrored reflection.

The main question concerns the development of technology, identifying performative relationships with props within the selected films, and subsequently reconfiguring them into technological relatedness through a process of translation. Specifically, I ask whether the study of the relationship between an actor or character and a performance prop or enacted technology in film can offer a pathway toward the reconfiguration of technology beyond instrumentalisation. This question is particularly significant given that the objects examined originate in fiction, yet the aim is to translate them back into reality. The findings reveal four modes of relatedness with technology, each framed through symmetry, networks, and the role of technology as a social relay: training as a mode of engagement with the collective, control as plurality, technological relations through instauration, and the socialness of machines. Together, these modes suggest that intelligent technologies could be reconfigured to operate within networks of relatedness, where instrumentalisation is understood as part of a collective common rather than a source of individual privilege or convenience.

II. Author's Declaration

This thesis represents partial submission for the degree of Doctor of Philosophy at the Royal College of Art. I confirm that the work presented here is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

During the period of registered study in which this thesis was prepared the author has not been registered for any other academic award or qualification. The material included in this thesis has not been submitted wholly or in part for any academic award or qualification other than that for which it is now submitted.



Nicolas Marechal

June, 2026

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VI. Definitions

Approaching intelligent technologies through props necessitates the development of a specific vocabulary. I use the term *technological prop* as a general designation for objects in film that simulate a working technology through different relational means. The process of developing a technology through the analysis of a technological prop is articulated through five distinct stages each defined by its context, ontology, and agency (Table VI.I).

Table VI.I

The five stages of development of a technology through props.

stage	fictional technology (1)	performance prop (2)	performative relationship (3)	enacted technology (4)	performative technology (5)
context	story / script	stage	stage / film	film	reality
ontology	textual	material	relational	technological in the fictional world	technological in the real world
agency	imagination	inspiration	instauration	enactment	mixed

The context refers to the setting in which the development of technology unfolds, tracing its trajectory from fiction to material reality. The ontology of the technological prop varies across these stages, it may be textual, material, relational, or technological. Each stage is also associated with an agency reflecting the prop's capacity to act through imagination, inspiration, instauration, reception, and usage.

Characterisation

It refers to the development of a fictional character as a co-production involving the writer, director, production team, actors, and consultants.

Enacted technology

A technology depicted in a film as functional, regardless of whether it actually functions. The technology is part of a situated action, reliant on its material or social circumstances (Suchman, 2012). According to this thesis, it is the fourth stage of a technology-in-making.

Fictional technology	A technology that is described in a novel or a short story. According to this thesis, it is the first stage of a technology-in-making.
Intelligent technologies	A regrouping of various of technological paradigms with differing levels of agency and autonomy, such as ubiquitous technologies (Weiser, 1991), smart objects (Marcelo & Thalmann, 1998), persuasive technologies (Fogg, 2003), pervasive computing (Nieuwdorp, 2007), robotics, and artificial intelligence.
Performance props	A prop that used by an actor on stage during a performance. According to this thesis, it is the second stage of a technology-in-making.
Performative relationship	This is central to my methodology. It is the key moment that I identify in the relationship between the performance prop and the actor or the enacted technology and the character. According to this thesis, it is the third stage of a technology-in-making.
Performative technology	A technology that has undergone a fictionalisation process and is now regarded as equivalent to real technology, even though it may retain some fictional elements. According to this thesis, this represents the final stage of a technology-in-making.
Technological prop	A technological object fabricated for the purpose of use in a film, either as a performance prop on the stage or as an enacted technology within the narrative, which serves to demonstrate the application and implications of technology.

Section narrative

This is directly related to my methodology. It presents a new narrative that emerges from analysing the film from an actor-network perspective, centring on the formation of the prop and the character, uncovering the multiple agents involved in their creation and maintenance.

Speculative affiliation

Drawing on Lucy Suchman's concept of affiliation (2011) where an existing object is brought back to a lab to be designed again. I use affiliation as a speculative concept, serving as a means to explore how a similar issue has been resolved by other technological props.

Additional terminologies specific to this field of study are provided in the glossary at the end of the thesis.

Chapter One

“What matters with technology is
more engagement and less alienation”

— Mark Coeckelbergh, 2012

“Cosmopoiesis, or world-making, always starts from
a world already at hand; the making is remaking.”

— Marco Frascari, 2011

1.1 Overall Introduction

This research is situated within the field of interaction design, where interaction with technology is examined for its potential as a social agent. To explore the relational potential of interaction and its impact on society, my study focuses on a combined analysis of film props and intelligent technologies. I argue that these two categories of object share more commonalities than previously thought and that the study of props can provide valuable insights for the design of intelligent technologies. Two key aspects underpin this research. The first concerns the evolution of interaction design itself, which is the branch of design most closely engaged with technology, having progressed from a focus on facilitating the use of technology to fostering critical engagement with it. Given the environmental and democratic crises we face today, I argue that the field should further embrace its social role, shifting its focus from the instrumentalisation to the mediation of technology, fostering more meaningful connections between individuals, society, and the environment. To achieve this, I introduce the concept of *technological relatedness* as a challenge to the current development of technology which remains primarily focused on instrumentalisation and little on the consequences of this approach. The second key element is the use of film props as discursive tools supporting the development of this specific approach to technology. I adopt the perspective that technology is first imagined before it is enacted. From this standpoint, I argue that studying the development of props can help with the design of intelligent technologies. Firstly, in film, they allow us to envisage the consequences of technology through their situated actions and their thematic explorations. Secondly, on the stage, they offer an intelligence of the moment as they help

actors solve issue with their roles. This malleable nature of the prop reveals new dimensions of social interaction for their relational quality.

Envisaging the multiplicity of agencies (human and non-human) and ontologies (human and machine, prop and technology, real and fictional), I consider actor-network theory (ANT) as my principal method. I deploy a mixed methodology of comparative object-network analysis informed by archival research, expressed in case study format. I formalise this method as a design translation that takes the existing relationships with *performance props* or *enacted technologies* into a new social relationship with intelligent technologies through relatedness. The development of this new technology, the design process, is conceptualised here as an act of translation, drawing cues from film and stage performance to uncover new potential pathways for the creation of socially capable intelligent technologies. This act of translation is a reconfiguration of objects, which requires ensuring the relational and societal dimensions of the objects are thoroughly considered.

The aim of this thesis is to investigate the potential of props, with the goal of informing the development of intelligent technologies. With the notion of technological relatedness, I propose an alternative approach to the development of technology that is socially oriented. I posit that there should be a space where technologies can play a clear role, extending their role as mediators. This involves making intelligent technologies that act as a relay with the social and the environment. The relationship between the character and the enacted technology in film (as a theme) or the actor and the prop on the stage (as practice) is explored to understand their mutual influence. However, analysing props as a lens on technology can introduce biases, as film scripts often reflect contemporary trends, the utopian or dystopian visions of directors, or the normative perspective of consultants. The dramatic context of props risks amplifying their significance unexpectedly. Rather than looking away from this issue, I consider this aspect of props to be an integral component of their larger social role. Films, in this context, serve as platforms that magnify the projected qualities of technology (Chapter 8) but can also be used as a platform for criticism (Chapters 5 and 6). Viewed this way, props function as agents of change, as performative technologies that I examine then reconfigure. Thus, the examination of technological relatedness is not framed as a definitive solution but rather as a means of exploring new potentials of our relationship with technology in films and translating it into our lives.

My objective is to identify, investigate, and compare a series of technological props

that reveal specific relationships between people and technology, either within the filmic narrative or on set. These props are reconfigured into intelligent technologies through the insights generated by the research. I have selected props from five films directed by Stanley Kubrick, which allow me to focus on two primary themes: the *mechanisation of humans*, represented by a gun, an aversive treatment, and a mechanical glove; and the *humanness in machines*, illustrated by an emotional AI and a pair of sociable robots. The research is guided by the following specific objectives:

1. Trace the socio-material formation of each technological prop and characters to determine the specific role of the technological prop in shaping those relationships and problematise human–technology interaction.
2. Identify and analyse the performative relationships between the technological prop and the character or actor in order to articulate another model of relationship with intelligent technologies.
3. Compare technological props across films, highlighting recurring paradigms or tensions in the representation of intelligent technologies.
4. Reframe the prop through a broader social issue by moving beyond instrumentalisation toward mediation and relationality.
5. Reconfigure the prop into an intelligent technology, informed by the notion of technological relatedness.

Throughout this study, I argue that the selected props exhibit strong agency, demonstrating their capacity to exert influence on the actors or characters on or off the set. However, the agency does not originate from one person specifically, but often includes the writer, director, film actor, industry professionals, academic consultants and the object itself. This distributed agency is evident throughout, where influence can be characterised as a relay, describing how agency circulates through and across human and non-human actors. To demonstrate the specific form of agency they exercise on the stage (see Chapters 6 and 7) or in the film (all chapters), I create a method that clarifies the *performative relationship* (my own term) between the key prop and its context. The primary research question concerns the development of intelligent technology using the relationship with the prop as a starting point: **How might the performative relationship with technological props be translated into technological relatedness?** To answer this, I address three secondary questions for each case study:

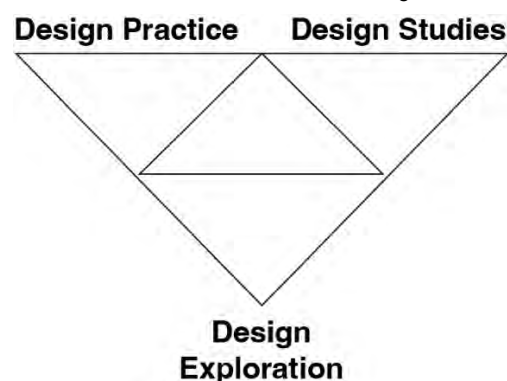
1. What is the performative relationship and where is it located?

2. What key issue does the prop perform in the film, and is this issue addressed or resolved by other props?
3. What is technological relatedness, and how might it be conceived as a form of innovation that moves beyond the instrumentalisation of technology?

To present my contribution, I draw on Daniel Fallman's (2008) basic model of the interaction design research triangle, situating my work between two areas: design studies and design exploration (Figure 1.1). In the first area, design studies, my primary contribution is conceptual and lies in advancing the study of technological props as a means to study relational dynamics with technology. By analysing films that question, amplify, or imagine alternatives to existing technologies, this contribution offers a way to critically engage with the societal implications of interaction design. This approach also enables a rethinking of the development of technology in terms of performativity. Rather than evaluating technology solely on the basis of its function or technical capability, I propose an alternative evaluative framework that foregrounds the relational meaning technologies carry. The second contribution, also conceptual and within design studies, involves examining the role of technology as a relay (Callon & Law, 1997), through which I extend Latour's (1994) theory of mediation and Gilbert Simondon's theory of transindividuality (Simondon, 1958/2017), by introducing the concept of technological relatedness. This concept problematises the human-technology relationship in terms of process, symmetry, and network. Process foregrounds the constant presence of technologies and frames them as part of the ongoing dynamics of relations. Symmetry problematises the agency of technology, which is especially important when the social is considered. Network, finally, functions as a means of counterbalancing this agency by embedding technology within a field of relations, actors, and responsibilities.

Figure 1.1

Fallman's basic model of interaction design research.



Note. Based on Fallman, D. (2008). The Interaction Design Research Triangle of Design Practice, Design Studies, and Design Exploration. *Design Issues*, 24(3). MIT Press.

The third contribution is methodological and falls within design exploration, an area concerned with examining ‘possibilities outside current paradigms’ (Fallman, 2008). Drawing on Latour’s concept of translation (1994), I develop a methodological approach to designing technology that uses the relation with technological props as a basis for inquiry. This method is presented in three steps. The first is to identify the formation of a relation through its performativity. Such relations may be rooted in structures of power and care (Chapter 5), revealed through the durability and boundary effects of objects (Chapter 6), emerge through the co-individuation of a character and a prop (Chapter 7), or be explored through the humanness of machines (Chapter 8). Performativity therefore acts as a mode of discovery, revealing relations that are reproduced through institutions, shaped during production, or tested through encounters with intelligent technologies. The second step, speculative affiliation, identifies alternative forms of performativity through comparison with other props, showing whether the original prop reproduces (Chapters 5 to 8) or challenges (Chapters 5 and 8) particular ways of relating to technology. The final step is composition, through which the assumptions of modernism are carefully dismantled. The aim is to reconnect individuals with the collective by translating these insights into networks of relations materialised through technological relatedness.¹

The development of technological props in films should be understood as a means to aid the reconfiguration of our relationship with technology. The diversity of findings across the chapters can be attributed to the thematic focus on the mechanisation of the human and the symmetrical notion of humanness in machines, rather than the examination of a specific category of objects. Each step involves a reframing process shifting the focus from the specificity of the theme in the film to a broader context of technological relatedness. These steps, along with their theoretical reframing, constitute the translation of a performative relationship with a technological prop into technological relatedness with intelligent technology. Consequently, the diverse findings reveal multiple modes of relatedness rather than a single, unified approach.

This section explores the key findings. The development of technological props in films should be understood as a reconfiguration of our relationship with technology. Performative relationships emerge from the research in various ways: entirely within the

¹ According to Latour (2007), the word collective is an alternative to the word society that focuses on the association between humans and non-humans where the agency of the non-human is taken into consideration: in my case the non-human is a technological prop.

film (Chapter 5), partially within the film (Chapter 8), on stage (Chapter 7), or across both film and stage (Chapter 6). For example, the Marine Creed's reconfiguration of the human-object relationship through the training of soldiers is covered in Chapter 5. By reframing the prop outside its military context, the intelligent technology reflects a broader challenge, in which individuals fail to engage with collective issues, such as sustainability. From the perspective of technological relatedness, I suggest that intelligent technologies should approach training as a relationship of co-individualisation with technology, such as the relationship with electrical infrastructures, by revealing their fragility and emphasising their collective nature. In Chapter 6, the Ludovico Treatment exposes the tension between free will and behavioural control while the performative relationship identified as a *pain as a common* as a means to describe how suffering circulates across life, the novel, film, actors, and through the technological prop. By reframing the prop outside its original context, this proposal explores how intelligent technology might facilitate a deeper connection with nature through the recognition of pain. Here, pain is understood as a mode of connection with a living system under threat, such as an aquaponic system that guides people towards a more responsive and caring relationship with nature.

Chapter 7 discusses a glove which helps an actor and director figure out a role through a new reading of the object, while the performative relationship demonstrates a process of instauration in which the actor and object mutually shape one another on the stage, producing an agency that appears to exceed the user in the film. From the perspective of technological relatedness, I propose that motorcycles use instauration as a form of social competence. Finally, Chapter 8 explore the emancipation of intelligent technologies through the combined study of HAL, David, and Gigolo Joe. The performative relationship reveals the possibility of machines constructing their own myth of a reimagined form of intelligent life embedded in a relation with nature and shared world-making. Together, these cases invite a reconsideration of the mediation of intelligent technologies as co-individuation through training, control, instauration, and socialness.

In the next few paragraphs, I examine the overarching topic in more detail. Given the various crises we face, it is essential to reflect on our relationship with technology in our lives and advocate for a paradigm shift such as technological relatedness. Particularly, I examine the topic of instrumentalisation of technology as critical. It originates from a diverse scholarship that critically interrogates this concept in relation to technology (Arendt, 1958/1998; Feenberg, 1999; Feenberg, 2010), the social character of technology

(Latour, 1991), the reconfiguration of technology (Suchman, 2007), and the need for a proactive conception of technologies (Dickson, 1974; Franklin, 1990/1999) or alternative technologies (Jamison, 2002). Design theorists pick up on this critique of instrumentality or, more generally, the role of technology in modernity (Dilnot & Staszowski, 2020).

The development of new technologies is often seen as objective, making things more efficient, comfortable, and convenient. In brief, the current paradigm reinforces the notion of modernity and the role of technology as an instrument. While there are cases where it makes sense to see technology this way, the abuses we face from the machines we create (Agre & Rotenberg, 1998; Scharre, 2018; Rifkin, 1995; Filimowicz, 2022), the critical role of technology in democracy (Feenberg, 2010) and the climate crisis (Coeckelberg, 2021) require us to examine alternatives to the development of technology. I suggest that machines should move beyond merely addressing and exploiting our immediate needs, shifting instead toward harmonising with the broader functioning of the world. This is the paradox of technology; while it seems essential to our contemporary life, it does not help what Hannah Arendt calls the 'human life process' (1958/1998, p.151), meaning the care for humanity that is more than 'a collective of lone individuals' (Stawarska, 2019).

This separation between the mechanical and society is well described by Bruno Latour (2004a), who contrasts matters of fact with matters of concern, highlighting the distinction between objective realities and the broader social, ethical, and political contexts that imbue them with significance. This approach goes beyond critique that merely questions power, society, or discourse, which have, as Latour (2004a) argues, 'outlived their usefulness and deteriorated to the point of now feeding the most gullible sort of critique' (p.5). Instead, I propose shifting from a purely factual perspective to framing technology as a matter of concern, a site that demands protection and care, reflecting its integral role in shaping and sustaining society. However, the question is not simply how to transform a dysfunctional relationship with objects into a functional one (Wiltse, 2020), but to discover new ways to bring humans together by reconfiguring technology to foster a better relation between humans and non-humans.

Cinema is regarded here as a laboratory through which a collective experiments and articulates inventive perspectives on our relationship with technologies, from the script to the making of props and their presentation on the screen. Films are employed in interaction design to explore representations of the future (Dunne & Raby, 2013), to prototype technological objects (Bleeker & Rozendael, 2021; Johnson 2011; Kriz et al., 2010) and interfaces (Shedroff & Noessel, 2012). Additionally, films can introduce new

technologies through dramatic performance, using diegetic prototypes (Kirby, 2011), where prototypes are depicted as fully functioning objects solving specific issues. By extension, diegetic objects can also exist in gallery settings where they open new worlds to audiences (Dune & Raby, 2013). As films bring inanimate objects life, they often bring a whole new world where technology plays a crucial role, but not necessarily a critical role in the technology of the present. I reframe technology as a critical matter of concern, borrowing from Latour (2004a) who defines a *matter of concern* as ‘what happens to a matter of fact when you add to it its whole scenography, much like you would do by shifting your attention from the stage to the whole machinery of a theatre’ (p.39). In other words, to understand the phenomena surrounding the creation of technology, there is a need to go beyond the film (the facts) and engage with the scenography (the concern). To do so, I consider the study of technological props as a path to creating knowledge about the interaction between people and objects.

This thesis is concerned with the making of technology by accepting the ‘primacy of the humanities over technologies’ (Mitcham, 1994, p.34). I examine the role of instrumentality, which can be considered a necessary byproduct of technology, expressed in the language of efficiency and productivity (see Winner, 1991). The objects we use daily are made by humans for human use, and reflection on them often stops there entirely, but looking at technology through humanities is about revealing the wider influence of technology on people. Hanna Arendt (1958/1998) defines instrumentalism as the assumption that ‘every tool and implement is primarily designed to make human life easier and human labour less painful’ (p.151). However, she also says the tools we make are intended to build a world but, in return, that world is not necessarily helping the human life process. At this point, there is a choice, which is to see technology as neutral (Pitt, 2014), or look at it as a substantive social force located within a network of human relations (Verbeek, 2005; Tiles and Oberdiek, 1995; Feenberg, 1991; Latour, 1987) and recognise that our instruments are also ‘institutions in the making’ (Winner, 1991, p.302). To further this distinction, researchers such as Latour (1994) interrogate the agency of technology by looking at it in terms of mediation.² My argument, therefore, centres on the social character of technology, its influence as a relay by emphasizing how people become indistinguishably hybridised with it. The entanglements between technologies and humans result in

² Latour uses a variety of terms to discuss the mediation of objects such as link (1987/1991), influence (1990), chain (1992), association (2005a) or subsistence (2013). I principally use Callon & Law notion of relay (1997).

reciprocally transformative effects, reshaping both entities in the process.

Interaction Design as a Social Mediation

My research is situated in the field of interaction design. Dan Saffer explores the discipline from three viewpoints: a technology-centred view, a behaviourist view, and a social interaction view (2010). The purpose of the first is to make technology ‘useful, usable and pleasurable’ (Saffer, 2010). The behaviourist view, according to Jodi Forlizzi and Robert Reichmann, is about ‘defining the behaviour of artifacts, environments, and systems’ (Saffer, 2010). It shows that the discipline is mostly concerned with a functionalist perspective, to make things usable, pleasurable or efficient. While the first perspective is rather innocent, the second uses stronger analysis to enforce the use of objects by a combination of engineering and psychology. This perspective is often found in human computer interaction (HCI) literature. The third view interest me the most as it examines the social role of the object. The social interaction view of interaction design includes references from sociology, such as interaction as a performance with initiation, maintenance, and leave-taking (Goffman, 1955). In my opinion, design scholars such as Victor Margolin and Daniel Huppatz represent this perspective. They adopt the pragmatist philosopher John Dewey’s concept of interaction (1938) to characterise human experience as extending beyond a merely instrumental relationship between individuals and products. Margolin (1997) builds on this perspective by emphasising the broader relationship between people and their environment, while Huppatz (2020) highlights the role of artefacts in shaping ‘human behaviour, experience and thinking’ (p.13). According to Huppatz (2020), objects do more than fulfil a utilitarian function, they also perform social, political, economic, and ideological functions. By wanting to go beyond the utilitarian functions of design, Huppatz (2020) and Margolin (1997) seek to include the social in the design of interactions.

Interaction design should align with the philosophy of technology by moving beyond a purely instrumental perspective based on the idea that, ultimately, it is not *things* that are to be designed, but rather the *interactions* between humans and things (Verbeek, 2014). Peter-Paul Verbeek suggests approaching the design of interaction as a technological mediation. The interaction becomes the result of a relation where the human and the object mutually influence each other. By reducing the importance of the user, mediation helps break away from the instrumentalist perspective. Within this view, two main schools of thought can be identified: the empirical, represented by Latour, and the post-

phenomenological, represented by Don Ihde and Verbeek. The post-phenomenological approach seeks to address how technology co-shapes human access to reality, emphasizing the micro-level interactions between humans and technological artifacts. While this adds to the understanding of the relation with technology, I chose to contribute to the empirical approach instead. This approach focuses on the broader impact of technology on the collective, examining its societal ramifications. In other words, the former focuses on *my* experience and the latter on *our* experience (Kaplan, 2009) (the emphasis is mine). Peer Schouten (2013) claims that Latour's 'political society is in the first place the result of introducing non-human entities that give durability and "body" to social arrangements' (p.559). Through the use of props in cinema, design serves as a platform for critical reflection on the impact of technology on society, enabling an exploration of the complex interactions between humans and technological artifacts.

Intelligent Technologies

The central focus of my research is on what I refer to as intelligent technologies. I deliberately chose this non-specific term to enable the reclassification of a range of existing technological paradigms, while maintaining compatibility with future developments. These technologies are known for their ability to respond to specific situations or individuals with a certain level of autonomy such as *ubiquitous technologies* (Weiser, 1991), *smart objects* (Marcelo & Thalmann, 1998), *ambient intelligence* (Hansmann, 2003), *persuasive technologies* (Fogg, 2003), *pervasive computing* (Nieuwdorp, 2007), robotics and artificial intelligence (AI). For example, Mark Weiser (1991) claims that 'the technology revolution will move into the everyday, the small and the invisible..., the most profound technologies are those that disappear. They weave themselves into the fabrics of everyday life until they are indistinguishable from it'. Much has been written about this statement, but what is most significant to me is the relational capacity of these technologies, how they embed themselves into society in ways that increasingly resemble human interactions, creating a pervasive sense of their constant presence and availability. Current technologies such as Apple Siri or Amazon Alexa exemplify this tendency quite clearly and recent development in AI further contribute to this progression. While these technologies facilitate our lives through their perceived intelligence, this level of convenience presents a significant issue. I therefore examine intelligent technologies through their ability to create a relay with society, exploring how their increasing capabilities and subsequent instrumentalisation may impact our social fabric.

The use of the term intelligence in association with technology faces criticism, particularly because the industry has yet to clearly define it in relation to human intelligence (Galanos, 2019). Typically, it merely implies an object's ability to simulate or imitate aspects of the human mind (Turing, 1950), enabling it to engage in exchanges with humans. However, there is also an inherent intelligence to an object that must be defined beyond computational intelligence. At first, props do not seem to have much intelligence as their role is mostly supportive of a dramatic plot (Bould et al., 2009), but the intelligence is not inherent to the object itself but emerges through interaction with it. For example, actors on set have the capacity to build their roles through engagement with objects (Chapter 7). This ability can be understood as an 'intelligent action' (Suchman, 2007, p.70), in which the circumstances of use enable and shape the actor's performance. This reflects not only a form of local intelligence, solely attached to the human, but also the contribution to a social intelligence, a capacity of the technological object to sustain and nurture the social fabric. Therefore, its ability to establish a relationship with the user is not merely a function, even less a technical capability.

The relationship between humans and intelligent technology is not a new concern (e.g. Suchman, 2007; Rosenberger and Verbeek, 2015; Turkle, 2017; Wiltse, 2020), nor is the broader study of human-object relations, as reflected in concepts such as affordance (Knappett, 2004), for example. As outlined earlier, I approach this relationship through the theory of mediation, which understands interaction with an object as extending beyond both the user and the object itself (Verbeek, 2014). When mediation is applied to society, as in Latour's work (1992), technology can no longer be treated as a neutral instrument. Instead, it becomes part of the relations through which social action is organised, delegated, and transformed. One concept that is particularly useful for describing this process is *scripting*. Introduced by Madeleine Akrich (1992), scripting refers to the ways in which technical objects distribute roles among the designers and the users. In this sense, objects and technologies do not simply perform predefined functions, they embody assumptions about social relations and participate in shaping them. Like a set in a performance, they establish conditions for action, while also leaving room for interpretation, negotiation, and transformation.

The literature review is directed towards the use of props as an aid to design, through various themes. The first examines props in relation to design, which authors explore for a variety of reasons, such as seeing the object in the context of use (Penz, 2006), for its ability to preserve ambiguities (Raijmakers, 2006), for its discursive potential

(Dourish, 2014), or as a gateway to the imagination of the designer in order to create public engagement (Dunne & Raby, 2013). The following themes examine theories and practice on props, with the aim of uncovering potential relationships and resonances with intelligent technologies. For example, early cinema theory investigates the potential of props for their specific agency (Balázs, 2010; Cavell, 1978; Epstein, 1926). Unlike intelligent technologies, however, props are analysed through the lens of their symmetry with actors, as highlighted by Epstein (1926). Thing theory goes further, showing props as an emergent material that treats reality and fiction on the same basis (Stern, 2004). This leads to the last theme which puts an emphasis on the performance of artifacts. The use of dramatic structure is explored (Laurel, 1991/2013) in an attempt to conceive performance in interaction design. Other concepts, such as persona (Cooper, 2014), offer potential for reflecting on the role of performance, particularly when considered alongside the reinvention of props as explored by Dunne and Raby (2013). Performance in the social (Goffman, 1959/1990) or as a design practice (Cooper, 2014; Dunne & Raby, 2013) leads to the rethinking of objects in performative terms (Suchman, 2002; Kirby, 2011) where the social implication of the object is considered. The concept of performative artifacts (Suchman, 2002) takes the perception of the object and its constant making together, looking at the local influence of the film actor, and influencing the making of other artifacts.

The objects of this study are five props from the films of Stanley Kubrick which can be grouped under the theme of the mechanisation of the human (Seeslen & Jung, 2001) and the mirror topic of the humanness of machines. The movies are presented in order of mechanisation from a soft influence (Pyle's rifle in *Full Metal Jacket*) to control (Alex's Ludovico Treatment in *A Clockwork Orange*), to take over (Dr Strangelove's glove in *Dr. Strangelove*), then, using the humanness of machines as a lens, the emotional outburst of a machine (HAL in *2001, A Space Odyssey*), in continuity with machines' ability to create a common cosmos (David and Gigolo Joe in *A.I. Artificial Intelligence*). The most recent of these films, *A.I. Artificial Intelligence*, was not directed by Kubrick, although he oversaw much of its original development. Following Kubrick's death in 1999, Steven Spielberg took over the project and brought it to completion.

1.2 Navigating the Thesis

This thesis is structured as a series of case studies, each focusing on one of Kubrick's films that explores themes of the mechanisation of humans and the humanness of machines.

The props are presented in order of mechanisation, beginning with the relation between a soldier and a rifle (Chapter 5), a treatment that exerts control over the user (Chapter 6) and a glove that dominates its user (Chapter 7). The final chapter is concerned with humanness, featuring a robot capable of emotional outbursts and culminating with two robots capable of constructing their own cosmos (Chapter 8). The technologies presented in the films are enacted technologies (a rifle, aversive therapy, advanced AI and robotics) and a performance prop (a glove), used to test various approaches that touch on military training, medical control, the intelligence of objects, and the sociability of machines.

Chapter 1, *Introduction*, establishes the foundation of the research, framing the overarching topic, outlining the thesis aims, detailing the original contributions to knowledge, and presenting the objectives, key findings, and scope of the dissertation.

Chapter 2, *Epistemological and Ontological Positioning*, situates the research ontologically and epistemologically before positioning it within the subject of interaction design. Positioning is treated here as an explicit acknowledgement that research is always conducted from within a particular set of commitments about knowledge, agency, and the role of design.

Chapter 3, *Cinematic Aided Design through Film Props, a Thematic Literature Review*, specifies the research context for the work, pointing to how scholars in design and cinema conceive of props. A thematic analysis of the epistemologies and the aims of those thinking through props helps identify a gap in knowledge and formulate the research questions. The first theme is the use of props in design, reflecting on the context of the object (Penz, 2018) as technological inspiration, thematic discussions (Dourish & Bell, 2014) or gateway to the future (Dunne & Raby, 2013). In the second theme, I examine how their existence often challenges modernity by refusing to be just one thing (Stern, 2004). I reference early cinema and things theory perspectives on props to show their specific agency and innate sense of symmetry with actors. Beyond the historical perspective, the next theme considers the prop for its performance with the actor, as an essential tool on stage, and how acting with technology can be considered performance in interaction design. Finally, from the visible performance, I extend the analysis to their social influence as a performance prop or enacted technology using the notion of performativity. Finally, I outline the main theoretical framework, mediation theory and my contribution through performativity, transindividuality and technological relatedness.

Chapter 4, *Creating a New Narrative using Cinema and Archives as Sources*, explains my methodological approach to the research. In order to achieve the aims of the study, I deploy a mixed methodology of comparative object-network analysis informed by archival research, expressed in case study format. In this chapter, I draw from science and technologies studies (STS) scholars to show the development of the prop as technology-in-making (Suchman, 2002). To this end, ANT helps me start from the perspective of the object, describe the relationship between people and object in a symmetrical way and create a new narrative focusing on the formation of the character and object through scripting. At the first stage, I examine the props through their development as performance props and their use in the film as enacted technologies in order to collect knowledge of the objects, actively seeking new narratives away from the film and centring my research on their potential. At the second stage, I investigate new possibilities of reconfiguration of technology, examining the props or technologies in terms of technological relatedness in reality.

Chapter 5, *Private Pyle's M14 rifle: Technological relatedness through Training*, is the first case study, in which I analyse training as a mode of engagement with the collective. I argue that a ritual such as the Marine Creed is a form of training that emphasises the human-object relationship. It aims to instil an understanding of the rifle's importance to the soldier's life while addressing an issue where soldiers, although capable of shooting, often chose not to aim properly. Reframed outside the military context, this reflects the broader challenge of individuals failing to engage with a collective issue, such as sustainability. Besides the main theoretical framework, I build on the morality of the object through the work of Verbeek (2010) and Latour (1994) to show how the theories of interaction should include a mode of engagement with technology that foregrounds the constraints of infrastructure, even if it undermines user convenience.

Chapter 6, *The Ludovico Treatment: Technological relatedness through Control as Plurality*, is the second case study. I argue that the technology presented in the movie is a boundary object. Such an object is understood as a network addressing the discontinuity between an object's presence and absence (Trompette & Vinck, 2009). In this case, the boundary is fragile as reality and fiction are intertwined. I demonstrate that the prop facilitates the propagation of pain, forming a connection between the author of the novel, the character in the film then, ultimately, the actor performing on the stage. This pain acts as a thread between social actors both outside and inside the film. I call this form of relay 'pain as a

common' as it connects a variety of actors through an issue. Theoretically, I draw on Latour's *Politics of Nature* (2004) and Mark Coeckelbergh's *Green Leviathan* (2021) to propose an alternative understanding of technological control that contrasts with behaviourist perspectives. I argue that technology may operate persuasively, but only for a limited period of time, as a pathway towards self-mastery.

Chapter 7, *Dr Strangelove's Glove: Technological Relatedness through Instauration*, is the third case study. I argue that the actor-glove interaction constitutes an *instauration*, in which the relationship is actively constructed and evolves through its use. Instauration is proposed here as a way of understanding how technological prescription and description emerge relationally, depending on the situation and on the user's action, or lack of action. As an example of technological relatedness, I examine the issue of motorcyclists in Taiwan who frequently ride on pavements, and consider how intelligent technology might contribute to improving their social competence. Theoretically, I draw on Etienne Souriau's (1943/2015) theory of the instaurative dialectic, which has recently resurfaced through Latour and Isabelle Stenger's (2015) work on the agency of objects.

Chapter 8, *HAL, David, and Joe: Technological Relatedness through the Socialness of Machines*, is the last case study and presents a series of fictional robots which challenge the conception the humanness of machines (Suchman, 2017). I argue for the necessity of designing machines capable of constructing their own cosmos rather than reducing them to systems that merely mimic humanness. I draw on HAL, as an early reference to AI which closely simulates humanness until its emotional outburst ends up killing people. Alternatively, the relationship between the robotic characters in *A.I. Artificial Intelligence* demonstrates a sense of solidarity between machines through their shared engagement with their own mythology. Theoretically, I build on the reconfiguration of technology when humanness is considered (Suchman, 2017).

Chapter 9, *Conclusion and Implications: From Performative Relationships to Technological Relatedness*, presents the key findings, the original contribution to knowledge, the limitations of the research and the recommendations.

Chapter Two

This chapter situates the research both ontologically and epistemologically. Positioning is treated here as an explicit acknowledgement that research is always conducted from within a particular set of commitments about knowledge, agency, and, specific to this thesis, the role of interaction design. I first outline my epistemological stance within interpretivist theory. It clarifies how my understanding of research as a process of meaning-making informs the symmetrical treatment of human and non-human actors. Then, I explain how my dual engagement with design practice and theoretical inquiry shapes the way technological relations are examined. The subsequent sections position my stance within the field of interaction design. They articulate a critical distance from instrumental traditions that prioritise optimisation and usability, while aligning with strands of Science and Technology Studies (STS) and critical Human Computer Interaction (HCI) that foreground the societal mediation of technology. This perspective is reflected in my approach to sustainability, for example, which emphasises social practice rather than behavioural control.

Aligning my thoughts with interpretivist theory, which proposes that social reality is constructed through human meaning and interaction, I recognise that research is inherently shaped by the perspectives and contexts of both participants and researchers (Denzin, 1989). That is to say, research is not neutral. As researchers, we bring our histories, values and identities to the field. My dual role as both practitioner and researcher places me in a unique position, neither fully insider nor outsider, but something between. This ‘insider-outsider’ dynamic has been long discussed in qualitative research, with academics recognising that being an insider can enhance trust and access. However, they also acknowledge that it brings the risk of assumptions, blind spots and over-familiarity (Dwyer & Buckle, 2009). Some argue that being an outsider allows for critical distance to be built between the researcher and participants, but agree that understanding context becomes significantly more challenging (Bukamal, 2022). While interpretivism foregrounds the situated production of meaning, this thesis extends that concern through STS by examining how meaning is also mediated through non-human actors, such as props.

This thesis approaches positionality as a methodological condition of the inquiry itself. Following Law and Urry’s argument that social science does not simply describe

reality but participates in its enactment (2004), I understand my position as a researcher as part of the relations through which the object of study is made visible, interpreted and reconfigured. The analysis of film props is therefore not a neutral observation of already-given objects, but an intervention that foregrounds certain relations while leaving others in the background. This does not mean that the research invents its objects arbitrarily. Rather, it recognises that objects become knowable through specific methodological choices such as performativity (Suchman et al., 2002) and scripting (Akrich, 1992). My positionality is therefore situated within an ontological politics: the thesis asks not only what intelligent technologies are, but what kinds of relations with technology the research helps to make more real. In this sense, my role is not to stand outside the world I analyse, but to work within its social and material arrangements in order to articulate a less instrumental and more relational understanding of technology.

I position myself as a practitioner engaged with theory. I am particularly concerned with avoiding what Latour (2005b) calls the *double-click*, the mistaken assumption that knowledge can be transferred directly and without transformation. This often results in simplified understandings of technology and its relation to society. For example, I find the application of behavioural theories in design problematic when they reduce complex relations to mechanisms of control. Rather than configuring technologies to steer, nudge, or discipline users within tightly defined parameters of use, I argue for a deeper engagement with social practice. How do we reconcile the urgency of the climate crisis with collective inaction? Can technology play a meaningful role in this context? How might we conceive of interaction in ways that move beyond individual convenience? Can technology contribute to linking the individual and the collective? I understand translation as a gradual process of transformation in which relations, rather than objects alone, become the primary concern. Drawing on Latour's argument that critique has 'run out of steam' (Latour, 2004), I use theory not only to expose the limitations of intelligent technologies, but also to compose new forms of relations with technology. From this perspective, design does not simply shape user action; it participates in assembling networks of humans, non-humans, practices, and environments.

My research into interaction design has shaped the researcher that I am. It can be situated within two distinct approaches, both central to this thesis, which I combine and deepen through further theoretical research. The first draws on Michel Maffesoli's concept of neotribes, which offers an alternative understanding of community. Neotribes are social

groupings based on shared interests (Maffesoli, 1996) rather than fixed social structures (DiSalvo et al., 2013). Through my teaching and research with master's students at the University of the Arts London, we observed that their interactions were often organised around a particular object, such as a fridge (Marechal et al., 2019), gardening tools (Marechal et al., 2023), or even a musical instrument for a journey to Mars (Zhang & Marechal, 2018). What was particularly fascinating about these groups was the extent to which the tribes projected their values onto these objects. From a design perspective, we worked with objects that were already in use and actively cared for by their communities. The examples presented in Chapters 6 (a smart textile) and 8 (an intelligent fridge) are drawn from this earlier research, which has not yet been published.

My research into interaction design also draws on Volker Pantenburg's research on cinema as an object (see Chapter 3, *Literature Review*). Cinematographic objects contribute to debates on human and non-human agency and frame cinema not merely as a mode of representation, but as an epistemological machine (Pantenburg, 2015). Through my research with BA students at the University of the Arts London, we examined the potential cultural impacts of such objects. For example, specific actions, such as holding a knife in a particular position, finding a suitcase, climbing a staircase, or locking oneself in a phone booth, could trigger images or sounds from the films of Alfred Hitchcock. My research builds on this epistemic capacity of cinema as a research tool, a perspective that I later deepened through the work of François Penz (see Chapter 3, *Literature Review*).

My disciplinary background in interaction design and cinema practice has led me to focus on the work of Stanley Kubrick, a director whose films frequently expose the difficulties of our relationship with technology. However, unlike film studies, which often approach films as representations to be interpreted, I argue that objects are not merely part of the background but actively participate in the co-production of relations. Drawing on the work of Latour, I adopt ANT as a methodological framework because it foregrounds the necessity of including objects within the analysis of social relations. At the same time, technological props are often understood in terms of their performativity, particularly through their ability to present situated technologies and influence audiences' perceptions of their role (Kirby, 2011). While I embrace this performative quality of technological props, I reorient the discussion towards what I call the performative relationship. This shifts attention from the influence of technology within the film narrative to the enacted relations between characters and technology, and actors and props, revealing forms of

technological engagement that extend beyond the narrative itself. Technological relatedness therefore examines relations through situated processes of action and resolution, where the intelligence of actors and the capacities of the network become resources for design.

In summary, I situate myself within the post-instrumental approach to critical HCI. This perspective seeks to problematise the relations that intelligent technologies establish with humans and the social worlds they inhabit rather than contributing to the refinement of interactive systems. Drawing on STS and critical HCI, the research adopts a methodology that acts as a generative method of reshaping what design inquiry can be. It engages with a soft approach to post-humanism to do so, by seeking symmetry between intelligent technologies and humans, and I suggest that these technologies should be developed through stronger forms of participation, foregrounding mediation rather than function. I hope my research can shift attention from technological solutions to the consequences of technological relations.

Chapter Three

Cinematic Aided Design through Film Props, a Thematic Literature Review

This investigation seeks to establish an understanding of technological relatedness between people and technology by examining technologies in fiction and their development as props. Consequently, the overarching argument posits that cinema provides a distinctive avenue for revaluing our association with intelligent technologies, particularly when their performative dimension is considered. This assertion underscores the role of technological props in shaping, interrogating and redefining our perceptions of technology. In the first part of this chapter, I undertake a comprehensive thematic examination of the literature pertaining to the use of props to inform the design process. The survey informs the development of the research questions. In the second part, I examine the theoretical framework used to develop the argument.

The preliminary segment of this investigation is dedicated to the examination of design scholars who use cinema as part of their process. This phase scrutinises the scholarly landscape, identifying and analysing the works of those who adopt a comparable perspective within the domain of design. Attention is directed towards scholars who assert that films transcend conventional visual representations, some looking at the situated use of the prop and others considering the agency of technology to study the future. The second section addresses the agency of props within the theoretical framework of thing theory and early cinema theory to explore the specific ontological quality of props. A subsequent point of inquiry engages with the body of literature that conceptualises the social as performance, aiming to unravel the interweaving of fiction and reality. Further thematic exploration delves into the convergence between technological props and intelligent technologies, accentuating their interweaving with both actors and users. The concept of performance is leveraged to reveal the nature of this relationship, while an additional layer of understanding is introduced through an exploration of the notion of performativity. The gap is identified by examining props through their development and the influences they exert as performative artefacts.

3.1 Cinematic Aided Design

Designers take films for inspiration and contextualisation in the making of tangible interactive objects. They are useful, firstly, for understanding the use of objects and as a means to explore the context around the relation with the object. Paul Dourish and Genevieve Bell (2014) posit that the cultural question should anticipate the design practice. They take an approach that resonates with the contemporary research on technology and accounts of technology and society in science fiction with themes such as surveillance, the role of the state, and equality and diversity, to question how technology enables certain values. This thematic approach allows us to examine the impact on society as a priority. However, as a critique, it does little to identify the role of technology or propose solutions for reconfiguring it beyond the current paradigm.

François Penz and Bas Raijmakers consider film to be an experimental space with objects that inspire better design. Penz (2018) uses film to research the use of space inside a building after its construction. He critiques the impact of digital design on the built environment, which he calls ‘notopia’ (2018, p.220), and instead advocates the use of film as a means of addressing issues of representation. An example of this is the film *Playtime* (1967) by Jacques Tati, which presents the dystopic tendency of urbanism and buildings. The plans are sound, but the space is empty. Penz sees cinema not just as images but as knowledge about the use of space and the elements of architecture. In interaction design, Raijmakers (2006) posits that design benefits from ‘film’s capabilities to preserve ambiguities and paradoxes’ (p.229). The context of interaction is not just an object but includes ‘issues of aesthetics, emotion, personal expressivity and cultural value’ (Raijmakers et al., 2006, p.229). The approach I develop in this thesis takes their work as a foundation, as I consider the potential of film to inform interaction design through situated objects while positing that props offer an opportunity to consider the agency of objects, which is also relevant to my field of study.

Throughout, I engage with speculative design in order to provide further context for understanding the importance of props in design, making them highly relevant to the analysis of networked and intelligent objects. Dunne and Raby (2013) are at the origin of this school of thought, ‘positioning design speculation in relation to futurology, speculative culture including literature and cinema, fine art, and radical social science concerned with changing reality rather than simply describing it or maintaining it’ (p.14). To speculative designers, props do not tell us about the world now, or how to make it better, but ‘about

other possibilities altogether' (Dunne and Raby, 2013, p.23). Their use of props brings the ability to design proposals, bring the story 'closer to our own world away from the worlds of fictional characters' (Dunne and Raby, 2013, p.90). However, their engagement with film props is limited as they consider them useful only within the context of the film. They align with Piers D. Britton who argues that 'props have to be legible and support plot development; they have to be readable, which undermines their potential to surprise and challenge' (Bould et al., 2009). While Penz and Raijmakers are concerned with a design that is situated, Dunne & Raby use the prop outside of film for the creation of other worlds and alternative futures.

For Dunne and Raby, props blur the barrier between reality and fiction by transforming it into a gateway, they call these *public engagement props* (2013). This new role proposes using props to 'think about alternative possibilities—they challenge the ideals, values, and beliefs of our society embodied in material culture' (Dunne and Raby, 2013, p.102). While they take inspiration from the objects of cinema, Dunne and Raby diverge from film props, as a way to go 'beyond a filmic support function and break away from clichéd visual languages that prop designers are often obliged to use' (Dunne & Raby, 2013, p.101). However, design fiction takes a similar approach to speculative design (Bleeker, 2009; Sterling, 2005), but the outcome of the design is a film. As a design practice, design fiction explores alternative possibilities, bringing new worlds to life and rethinking our relationship with technology. However, in contrast to speculative design, the designed prop remains confined within the film. This demonstrates that props can function as critical objects, depending on the film's ability rather than the medium itself to achieve this.

Cinematic aided design is a term I borrow from Penz (2018) which I extend to include multiple views on the use of cinema in design. Firstly, cinematic aided design transcends conventional considerations of object functionality and usability by incorporating the user's ambiguities (Raijmakers, 2006). Cinematic aided design sees cinema as a form of knowledge that challenges everyday objects using dramatic situations (Penz, 2018). In contrast, speculative design uses props to inform the making of new worlds and plausible futures. Dunne and Raby (2013) understand the potential of the prop but prefer to make their own tangible objects, which they call public engagement props, which, in the case of design fiction, support their own narrative. In this view, the prop is seen as an inanimate object, as scholars are mostly interested in the situated relationship between fictional characters and technology (see Raijmakers, 2006) or the element of

architecture and people (see Penz, 2018). The use of props as tools of public engagement (Dunne & Raby, 2013) goes further and is explored below.

3.2 Cinematographic Objects and their Agencies.

An important characteristic of intelligent technologies is their ability to act autonomously using a script or algorithm, endowing them with agency. From my perspective, their apparent intelligence is an entanglement of fiction (the expectation) and reality (the action). I examine how films scholars and critics explore this entanglement in film. According to film critic David Bordwell (1985), when engaging with a film we identify agents, such as the characters, props and environment, which contribute to the story. A character with a gun, for example, is perceived as a threat. Bordwell represents the majority of critics who view the object primarily as an extension of the human. The robot in *Metropolis* (Lang, 1927) is an example of an object waiting to be activated by the actor in order to become a robot. This is a classical approach to agency where the prop entirely depends on the actor.

In a contribution to thing theory (Brown, 2001), Volker Pantenburg (2015) presents the concept of *cinematographic objects* which examines props in films. According to Pantenburg (2015): 'The screen is full of props, artifacts, material objects either created explicitly for the camera or merely picked up and recorded by it' (p.14). While Pantenburg sees them as static, Lesley Stern contributes further by describing the complexity of props. For Stern (2004), a prop is 'phenomenal and ephemeral, solid and phantasmatic, it partakes of both a fictional and a documentary identity, it is real and imaginary, a thing and a commodity' (p.396). This duality of the prop breaks from the perception of the designer who examines the prop from either side of the screen but never both sides. Indeed, the material of cinema is a peculiar material that possesses a natural ambivalence. Stern (2004) sees the 'poetic apprehension of the film' as opening up a 'productive space for contemplating the mutability of things in the cinema' (p.395). This approach to props through mutability demonstrates the specificity of cinematographic objects by attending to their shifting qualities both on stage and on screen. It creates a point of convergence with intelligent technologies which, I argue, also possess their own duality. On one hand, they provide utility to individuals, but on the other, they produce consequences for the wider collective.

I pursue this perspective by examining scholars of the silent era of cinema (1900-

1930) when actors and objects reached a point where they could be symmetrically considered. For example, Béla Balázs (1930/2011) embraces the life of objects by giving them faces. At first, this may seem to be a form of anthropomorphism, but his approach to objects evokes an early version of Stanley Cavell's (1978) concept of photogenesis, a conception of film that falls within the genre of expressionism, a subjective approach in which the surface of things is distorted by the psychological or spiritual character of the film. In silent movies, everything 'acts', creating an equivalence between objects and actors through the shared concept of 'face'. This creates an interesting antecedent to the anthropomorphising of robots (see Chapter 8). Balázs (1930/2011) explains this through the way children see things as autonomous living beings with souls and faces of their own. Children do not yet judge things purely as tools or means to an end. This way of animating the world is important when you consider technology as a thing, not just as a mechanical object which can easily create a relation with the user. This form of relation, however, is one sided or anthropomorphic (for the sole benefits of humans) rather than symmetric (as a durable relation) which is the core argument of this dissertation.

Actors in early cinema had no voice, so they had to share their agency with objects. The cinema critic Jean Epstein talks of a 'soul' of things, which he calls *photogénie*¹, saying: 'I will term photogenic any aspect of things, beings and souls that enhances its moral quality through cinematographic reproduction' (Epstein, 1926). This is a complex quote, subject to many interpretations, one being that of Christophe Wall-Romana who draws a parallel with Walter Benjamin's notion of the 'aura', which he sees it as the qualitative change resulting from cinematic mediation itself (Keller and Paul, 2012). The aura is indeed part of the mediation between the film and the spectator. I see the aura as a way to fill a gap, the invisible fourth wall between the audience and the spectator. The best way to explain the concept is through an example given by Epstein himself: 'A close up of a revolver is no longer a revolver, it is the revolver-character, in other words the impulse toward – or remorse for – crime, failure, suicide.... It has a temperament, habits, memories, will, a soul' (Pantenburg, 2015). Cinema gives life to props, in a form of vitalism, a theory popular in the last century. More recently, however, authors such as Betty Marenko (2014) argue for the framing of smart technologies in terms of animism. These theories, vitalism and animism, are relevant for their ability to frame a relation between the user and the technology in a way that goes beyond representation to highlight technology in terms of

¹ I use the French term '*photogénie*' (photogenic) to avoid any confusion with Cavell's photogenesis.

relation.

This symmetry between the object and the actor, although it may initially appear anachronistic, is theoretically embraced and accentuated by scholars such as Latour, who enshrines this conceptual alignment as a fundamental tenet within his actor-network theory (ANT). In his theoretical framework, the interconnectedness and mutual influence between human and non-human entities are posited as pivotal elements shaping social processes and technological dynamics. The inclusion of film props within this theoretical framework extends beyond their mere visual representation, situating them as active agents that contribute meaningfully to an actor-network. This approach allows me to shift the focus of mediation from the camera to the prop.

Thing theory, from the work of Pantenburg (2015) but mostly Stern (2004), questions the materiality of the prop by linking its lives on the stage and beyond the screen. This is important to me, as I seek to see the technological object in its totality, as both fiction and reality, in terms of expectation and consequence. Like props, intelligent technologies have a dual existence, one with the user and one with its network. Early film theorists such as Balázs (1930/2011), Cavell (1978) or Epstein (1926) argue that it is not all materiality, but also agency, albeit with the help of the camera, which is not important here. Through his concept of *photogénie*, Epstein draws on the relationship between actors and objects and highlights new possible interpretations for the audience to imagine other layers of reality. The use of the camera, however, has to be discarded for our study. Finally, the symmetry between actors and props in silent cinema (Epstein, 1926) reduces the usual hierarchy that is perceived when objects, including technological objects, are addressed. The recognition of this symmetry is an important point of this thesis. In the next section, I turn to the performance of objects in cinema, which provides an opportunity to interpret them in terms of process: first, the process of making, and second, their capacity to influence through their impact on the audience.

3.3 Props as Performances

Performance is a multifaceted term that carries different meanings across disciplines. In performance studies, it represents a manifestation of the discipline, while in social science, Erving Goffman (1959/1990) particularly frames our everyday lives as a performance. Occasionally, interaction design engages with the concept, for example, Brenda Laurel examines the process of interaction as theatre in her seminal book *Computers as Theatre* (1991/2013). Her approach to the topic focuses on the relationship between the audience

and the author, through the study of dramatic structure. Laurel claims that the author has 'less and less influence on the manipulation of plot, character and thought' (1991) which she sees as an opportunity for the development of interactivity. Her version of performance is original but also very formalistic as it does not address the specifics of the relation with the object.

Figure 3.1

Alex (Malcolm McDowell) and the Ludovico Machine in A Clockwork Orange (1971)



Note. Kubrick, S. (1971). Malcolm McDowell in the Ludovico test in the original trailer of *A Clockwork Orange* (1971). Wikimedia Commons. Creative Commons license.

Another way to approach performance in interaction design is through the work of Alan Cooper, who formalises the use of persona as a tool to put a face to the people he designs for in order to create accountability in design. According to Cooper et al. (2014), 'Personas are not real people, but they are assembled from the behaviors and motivations of the many actual users we encounter in our research' (p.62). This demonstrates that a persona functions as a shifting reference point, reflecting evolving and changing needs. These personas are brought to life during the design process but disappear entirely once the object is realised. They compare to *dramatis personae*, the characters in a film, such as Alex in *A Clockwork Orange* (Kubrick, 1972), in the sense that a role is given to them (Figure 3.1). While this seems different from the designer's persona, a performance is also required from the actor in order to give life to the character. It is similar in the sense that both the actor and the designer perform their work through the intervention of an external character.

Erving Goffman challenges the conventional demarcation between ordinary

individuals and *dramatis personae* by asserting that acting is not confined to the professional realm of actors, but is instead an integral aspect of everyday life. In Goffman's (1959/1990) words an 'ordinary social intercourse is itself put together as a scene is put together, by the exchange of dramatically inflated actions, counteractions and termination replies' (p.70). The persona in design does not require the same type of performance as in cinema but gives the designer an opportunity to have a conversation with the user.

Figure 3.2

ADG-Floppy Legs by James Chambers



Note. [Photograph]. Dunne, A. & Raby, F. (2013). *Speculative Everything*. MIT Press. Courtesy of J. Paul Neeley (2010).

Cooper's approach to the making of objects remains conventional while Dunne and Raby (2013) present an alternative use of persona through the work of one of their students, James Chambers, who takes the famous television presenter David Attenborough as an inspiration:

Chambers asks, what if David Attenborough had become an industrial designer rather than a wildlife filmmaker, who, still fond of nature, established the Attenborough Design Group to explore how animal behaviour could be used to equip technology products with survival instincts: a Gesundheit Radio, which sneezes periodically to expel potentially damaging dust, and Floppy Legs, a portable floppy disc drive that stands up if it detects liquid nearby? (Dunne & Raby, 2013, p.93).

Rather than inventing a persona to design a product, Chambers transfers some

values of the famous presenter to a tangible object (Figure 3.2). This demonstrates the possibility of transferring human values to the non-human but the persona only partially manifests in the object's performance. In their teaching, Dunne and Raby encourage this imaginative use of characters as props, as they convey 'ideas, values and priorities very effectively because of our innate ability to read other people's facial expressions, demeanour, gestures, posture and orientation' (Dunne & Raby, 2013, p.136). This is a reinterpretation of the early cinema approach to prop, a form of '*photogénie*' (Epstein, 1926), by giving soul to things. However, it is also questionable as the value of the object remains limited in comparison to the character it represents.

Performance is not just a transfer from one reality to another, where the prop and the actor are separate entities. Andrew Sofer views props as integral components woven into the very fabric of the performance (1988). Sofer attributes equal significance to the role of props, placing them on par with the actor's performance. Rather than emphasising a distinction between the prop and the actor, this approach acknowledges the interconnectedness of both, recognising the prop as an essential and equal contributor to the overall performance within the theatrical context. This perspective is crucial to this thesis, as it shows that the prop also benefits the actor in the performance. Surprisingly, this viewpoint finds little representation in the literature. Sofer holds a pivotal role in presenting the prop as a mediation, reframing the issue around the object rather than the screen.

The concept of performance reduces the separation between reality and fiction further by turning the spectacle to everyday life (Goffman, 1959/1990). In interaction design, it can take many forms such as the application of a dramatic structure (Laurel, 1991) or a process that supports the design through the development of a persona (Cooper et al., 2014). When it comes to the use of an actual prop, the transfer of values between a person and an object is questionable (Dunne & Raby, 2013). However, prop studies reveal that a prop is not merely an object waiting to be activated, but can play a crucial role in shaping an actor's performance on stage, positioning it as an essential element of theatrical expression (Sofer, 2003). This perspective may extend beyond the stage, engaging with the idea that objects can carry significance in everyday life.

3.4 Performative Props

The performative stance expands the role of props in cinema. I examine two perspectives. The first demonstrates how the prop 'contextualises technologies within the social sphere'

(Kirby, 2011), and the second focuses on the critical moment that is the development of technology (Suchman et al., 2002). David Kirby (2011) views the use of props as a means of making technology acceptable through the intervention of scientists in films. As he states, 'the role of the expert is often not to prevent the impossible but to make it acceptable' (Kirby, 2011). Kirby focuses on the influence of enacted technologies in immersing the audience in a narrative where technology becomes the hero, solving new types of issue.² In this context, cinema serves as a framework to contextualise the prop within a narrative, aiming to facilitate its acceptance by the audience.³ In this framework, props become a means to demonstrate new or practical uses of future technologies. Kirby's analysis stands out as a seminal examination of the pivotal role played by props and their societal implications. Nevertheless, a notable limitation of Kirby's perspective lies in his inclination to portray technologies in a normative light, ostensibly for the betterment of society. While he acknowledges the agency of props beyond the screen, he falls short of examining props in detail and their impact and fails to challenge the broader role of technology in society.

In contrast, Lucy Suchman is concerned with the viability and possibilities of nascent technology, using prototypes to assess artifacts within their social context (Suchman et al., 2002). She introduces the term *performative artefacts* to emphasise the relational and situated nature of technology and notably proposes a departure from traditional concerns with form and function. Doing marks a transition towards a performative perspective, which Suchman et al. (2002) describe as technologies-in-the-making (p.164). This theoretical shift enables a move away from a classical ontological focus on the essence of being toward an emphasis on ontogenesis, highlighting the processes through which objects come into existence. However, her concern for the social remains largely confined to the object's potential to influence those directly involved in the development of technology, and I aim to reconcile her approach with a broader engagement with the wider social context.

In summary, Kirby (2011) proposes a concept of performativity directed by the necessity of normalisation of emergent technologies. In contrast, Suchman et al. (2002) examine emerging technologies as performative artifacts or technologies-in-the-making

² He refers to props as diegetic objects, meaning objects that exist within the fictional world. However, I prefer the term enacted technology to emphasise the mediation of the actor or character instead of the mediation of the camera.

³ An example is given in the movie *Threshold* (Pearce, 1981), in which an artificial heart was first introduced in order to accelerate its acceptance by the public (Kirby, 2011, p.193).

elucidating the processes through which objects come into existence. Both are concerned with the role of technology in the future but Suchman et al. (2002) focus on the development of the object as a critical moment while Kirby examines the impact.

3.5 Summary and Research Questions

The review of the literature explores four themes linking the research on props and technology. The first presents the many uses of cinema for the development of technologies in design and interaction design. Films are often used in design for their ability to tell stories but also question the reality of our relationship with elements of architecture (Penz, 2018) or technology (Raijmakers, 2006). My approach combines elements of these perspectives by treating cinema as a source of knowledge, while setting aside its narrative and technical apparatus. I align myself with Dunne and Raby (2013) for the potential of film as a discursive object, but rather than producing objects of public engagement, I use their potential to reconfigure them into an intelligent technology.

The second theme examines the agency of props through thing theory and early film theory. Stern (2004) shows that props operate as both fiction and documentary, allowing them to be analysed in terms of development and social impact. Balázs (1930/2011) and Epstein (1926) further suggest that props can appear as living entities, raising questions of anthropomorphism that resonate with contemporary robotics, particularly Suchman (2011). This convergence informs my understanding of the relation between object and actor, and between technology and user, in terms of symmetry. This is further examined in the methodology particularly in relation to actor-network theory.

The third theme examines the prop and actor through performance. Following Goffman (1959/1990), I consider the permeability between the dramatic and social worlds, which allows technology to be understood as social performance, where the relation between user and technology is central. In interaction design, Cooper's (2014) personas can be understood as enactments that configure design through imagined users, while speculative props transfer values from humans to objects (Dunne & Raby, 2013). However, such performances remain limited if they overlook the agency of people or machines. Prop studies instead show how props actively shape performance (Sofer, 2003), which is central to my argument.

The fourth theme approaches performativity as the process through which props take on a social role. Drawing on Kirby (2011), Dunne and Raby (2013), and Suchman et al. (2002), I understand props as performative artefacts that both shape relations during performance and contribute to broader technological imaginaries. This reframes the prop as a process rather than a fixed object. I therefore focus on the relationship between actors and performance props, or between characters and enacted technologies, which I define as a performative relationship. This relationship is then translated into the context of intelligent technologies to reconfigure how we relate to them.

I identify a gap in the study of props in cinema by emphasising their nature as processes and their capacity to establish symmetrical relations. My main research question examines how *performative relationships* (my own term) can be identified within selected films, understood as the process through which symmetry between user and technology is established, and how these can be reconfigured into *technological relatedness* (my own term) through a process of translation, enabling the object to contribute meaningfully to the social sphere. **How might the performative relationship with technological props be translated into technological relatedness?** Underlying this are three sub-questions that inform the development of each case study:

1. **What is the performative relationship and where is it located?**
2. **What key issue does the prop perform in the film, and is this issue addressed or resolved by other props?**
3. **What is technological relatedness, and how might it be conceived as a form of innovation that moves beyond the instrumentalisation of technology?**

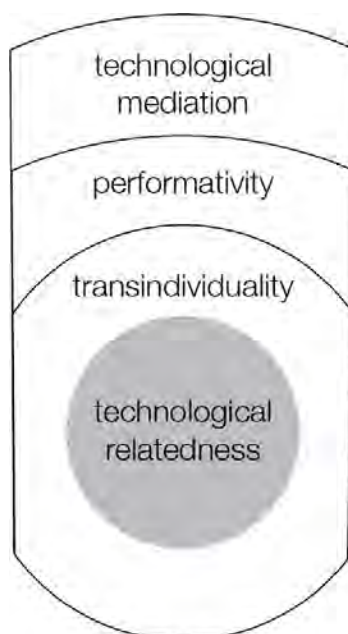
Specifically, in the first question, I ask whether the study of the relationship with a performative prop can reveal a path for reconfiguring technology in terms of relatedness. In the second question, I compare with other props in science fiction for their potential to address societal issues. The third question concerns the ethical realisation of technology, exploring how these insights can inform the responsible design of intelligent technologies. By doing so, I propose a relational object, one that moves beyond the instrumentalisation of technology and fosters a more reciprocal interaction between humans, objects and their broader socio-technical environments.

3.6 Theoretical Framework

Given that the aim of this thesis is to explore new ways of leveraging film props to evaluate our relationship with intelligent technologies, particularly in sustaining the social and our relationship with nature, I employ a combination of theories that enables me to examine this relationship in terms of co-constitution between the user and the object (Figure 3.3). The primary theoretical framework concerns the role of technology as mediation. This perspective draws on Latour (1992; 1994), who proposes mediation as a means of evaluating the impact of technology on society. From the perspective of interaction design, this approach positions interaction as the site where relations are co-constituted, rather than privileging either the user or the object. As a contribution to mediation theory, I examine this co-constitution as a process through two complementary theories. In the analysis, I focus on the discovery of this relation through the performativity of props, which enables a focus on the values embedded in enacted technologies and characters. Secondly, I speculate on this co-constitution through the theory of transindividuality (Simondon, 1958/2017), which situates technology within the formation of collective relations as an ongoing process. I call this co-constitution with intelligent technologies technological relatedness, which problematises our engagement with technology and enables a more explicit definition, grounded in an ongoing process that seeks symmetry across networks of relations toward the collective. Additionally, I incorporate other theories specific to the issues discussed in individual chapters.

Figure 3.3

A Visual Synthesis of the Theoretical Framework



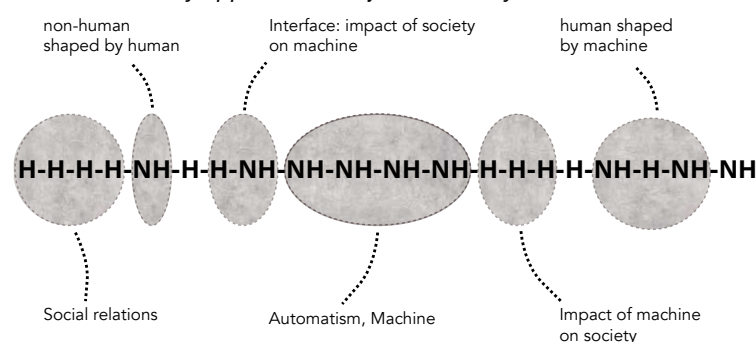
3.6.1 Technological Mediation

The central idea of mediation theory is that technologies, when they are used, help shape the relations between human beings and the world. This theory approaches technologies as mediators of human-world relations rather than material objects.

According to Verbeek (2019), mediation is the idea that human practice and experience are co-shaped by technology. Applied to interaction design, this means that the focus should be on the ‘result of the interaction’ (Verbeek, 2019), as user and technology mutually shape one another through the relations that emerge between them. According to Verbeek, interaction as a mediation is a relational process, and he acknowledges the agency of both the human and the machine. To acknowledge the agency of technology is important, as it plays a role in the ways in which we conceive the world.

Figure 3.4

Mediation Theory approaches Objects as Relays.



Note. [Diagram]. Based on Bruno Latour (1992). Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts.

In this thesis, mediation is understood as an essential process that contributes to society as a whole rather than in terms of its immediate effects on the user, as in the approach used by Verbeek (2019). For example, Verbeek discusses persuasive technologies (2012) specifically designed to influence people towards particular goals. While such technologies can promote positive behavioural change, they also give rise to concerns, as seen with social media platforms, which have been criticised for their influence on political processes (see Zuboff, 2020). Instead, I draw on the work of Latour (1992; 1994) who proposes that mediation is a means of evaluating the impact of technology on society. Using this perspective, I examine the potential of interaction as a social agent, emphasising its role as a relay (Callon & Law, 1997). While this approach recognises the impact of technology on individuals (Verbeek, 2019), it primarily focuses on the impact of machines on society and how individuals are shaped by these technological mediations (Figure 3.4). I

argue that intelligent technologies should be considered beyond their capacity to provide comfort or convenience to the user, for their impact on society.

3.6.2 Performativity

Performativity is addressed through Suchman's concept of the performative artifact (Suchman et al., 2002), an approach which facilitates an exploration of 'the imaginative and practical activities through which socio-material relations are reproduced and transformed' (p.164), thereby conceiving the object as an ongoing performative creation concerned with its impact in the real world. This raises questions about the agency of things, recognising that both human and non-human entities can influence one another (Pickering, 2016). The concept is widely used in the field of STS to challenge the assumption that representations merely describe the world. Instead, it suggests that representations actively shape and influence the very realities they claim to analyse (see Callon, 2006). Thus, performativity is valuable here for its ability to examine an enacted technology or a character for the ideas they carry by re-examining them in their relational context rather than the assumptions we make about them.

Building on these perspectives, I conceptualise performativity as a bridge between fiction and reality. According to John Law and Vicky Singleton (2020), 'technological knowledge arises within projects, project-work, and the telling of project-related stories' (p.767). The telling of stories about objects and their relationships is an essential part of understanding the performativity of the object. As Madeleine Akrich and Latour (1992) suggest, a technology being developed or presented to an audience is inherently performative, as it exists primarily in the minds of its creators which, in my opinion, includes the actor and can be extended to the audience. Although discussing fictional characters and props may seem to imply a separate realm, the actors are also real people (see Chapters 5, 6, and 7). Accordingly, the technology imposed on us often functions merely as a prop, preparing the ground for its final version. This exploration through fiction allows me to cultivate a different relationship with technology, encouraging a reconfiguration before the intelligent technology reaches its users.

The props in cinema are performative technologies which are assembled by a variety of social actors (writers, directors, actors, etc.) during the production process. They are constructed as statements about technology, but also the social world they describe (see Chapters 5, 6, and 8). For example, the suicide of Pyle presents questions about

military training (Chapter 5), with the social actors turned into objects and vice versa. The mechanisation required in the training of Pyle enables me to examine his sergeant in terms of power and his colleague in terms of care. Through the Marine Creed, the soldier develops a relationship with his rifle that surpasses his relationship with other humans. For Law & Singleton (2020), 'the difference between telling stories and acting realities isn't so large. It's a continuum, not a great divide' (p.769). Whether referring to scripted technologies or scripted technological props, the concept of scripting represents a widely adopted framework for understanding and guiding technological development. Stories and performances contribute to the making of the technological world. This idea is crucial for understanding that fiction is not merely representational but also embeds performativity, actively shaping technological imaginaries and practices.

The performative study of technology through technological props can be approached at two levels. Firstly, it demonstrates the importance of using the paradigm of technology-in-the-making (Suchman et al., 2002) where a performance prop is developed on a stage through enacting its consequences (Chapter 5), by considering its origin (Chapter 6), as a practical invention through improvisation (see Chapter 7), and as a challenge to existing technologies (Chapter 8). The use of technological props demonstrates that the making of technology is 'grounded in doing things in a lively material world, growing out of that engagement' (Pickering, 2017). Secondly, the influence of enacted technologies, at a discursive level, leads to questions concerning the morality of objects (Chapter 5), their use as persuasive technologies (Chapter 6), or the normative influence of fictional technology on real technology (see Chapter 8).

3.6.3 Transindividuality

This theory bridges the gap between Verbeek and Latour's perspectives on mediation by providing the conceptual tools to understand the individual as a process of change and in relation to the collective. The concept of transindividuality consists of two dimensions: psychic individuation and collective individuation (Simondon, 2007). The former is 'interior', and the latter 'exterior' to the individual. According to Barthélémy (2015), individuation should be understood as a process rather than as an attempt to grasp a given being in order to determine the criteria by which we can know whether it is an individual or not (p.26). Simondon describes this as the process of making a brick from clay which, he explains, is not a process of moulding, an imposition of a form upon matter, but of *modulation*, in which 'matter and form are made present as forces' (1995).

Transindividuality understands relations as mutually constitutive processes through which individuals and collectives are formed together. Political structures are therefore 'regimes of individuation' (Read, 2016) that shape how individuals and collectives are formed, rather than external rules. Transindividuality challenges the traditional binary between individual and society by showing that the 'I' and the 'we' are produced through the same movement. This concept offers the precondition for a new practice of politics, one that moves beyond the search for a single revolutionary subject. For example, Yves Citton describes politics as a matter of pressures or gestures (2012), where the collective is understood as a series of unresolved tensions. Because social formations are considered as processes, any individual affect, myth, or gesture can potentially become the basis for new collective individuation.

Transindividuality offers a way to bridge the gap between the individual and the collective; however, the role of technology in mediating this process remains insufficiently articulated. Chabot (2013), for example, presents Simondon's perspective on technology as a possible solution to a problem, describing technology as the 'condition of individuation' (p.119). This formulation risks assigning technology a deterministic role. Feenberg (2016), by contrast, argues that STS and Simondon each define their domains by excluding what the other foregrounds. Simondon tends to treat the social as extrinsic to technical individuation, while STS often neglects the internal technical organisation of objects. Feenberg nevertheless identifies a development in Simondon's later work, in which Simondon moves towards a more constructivist account and 'imagines the integration of humanity, nature, and the machine in a future society that has freed itself from the ills of blind technification' (Feenberg, 2013).

In this thesis, the concept of transindividuality (Simondon, 1958/2017) situates intelligent technology within the formation of collective relations and identifies the elements that enable these new types of relationship. My focus is therefore on what may constitute collective individuation: the process through which individuals connect with the collective through a technological object. While mediation focuses on interaction with the object and the consequences that emerge from it, collective individuation addresses how technology modulates the individual towards the collective. Transindividuation then refers to the passage of this relation beyond the individual, showing how a relation with technology can circulate from one person to a wider community.

3.6.4 Relatedness

The main contribution to mediation is technological relatedness (my own term). It is derived from the anthropological concept of relatedness (Cartsen, 2000; Bird-Davis, 2016) as a challenge to the traditional notion of kinship by extending relationships beyond blood ties. Notably, it may involve the use of technology, as exemplified by cases such as children conceived *in vitro* (Strathern, 2000). While the use of technology is not central to relatedness, it opens the possibility of an association between humans through technology. According to Marilyn Strathern (2020), relatedness removes ‘the necessity of instituting the relation the way kin relations are’, therefore questioning hierarchy and coming closer to the idea of symmetry. The anthropologist Nurit Bird-Davis (2016, p.572) defines relatedness through her research into animism: ‘I am conscious of the *relatedness with* my interlocutor *as I engage with her*, attentive to what she does in relation to what I do, to how she talks and listens to me as I talk and listen to her, to what happens simultaneously and mutually to me, to her, to *us* [author’s emphasis]’. Bird-Davis proposes a mode of engagement with the other in which symmetry is central. However, this definition is missing an important element: the existence of a group that supports the conditions through which this engagement can operate. While relatedness refers to this as family, I instead describe it as a network.

Drawing from relatedness, I examine its potential applied to technology, which I term technological relatedness. Following Bird-Davis’ definition, I demonstrate that technological relatedness is a mode of engagement with the collective through intelligent technology, grounded in an ongoing process that seeks symmetry with technology across networks of relations. It is useful to see this as a complementary concept to the existing concept of technological persuasiveness (Fogg, 2003). Persuasiveness technologies are also a mode of engagement, but they are aimed solely at changing the user or improving the engagement with technology for the benefit of the owner. Such technologies were, initially, developed with positive intentions, as tools to motivate people or help them achieve their individual goals. However, when amplified through the internet, they have become instruments of influence that benefit technological consortia, often to the detriment of interpersonal relations and, in some cases, the stability of democratic governments (Zuboff, 2020).

In design, Dunne and Raby demonstrate the use of public engagement props to provoke discussion about the future through political or scientific issues (2013). While

these forms of engagement are important for cultural reflection, they can feel distant from the realities of everyday life. Through the concept of technological relatedness, I argue that engagement with the collective can go through technology. In this sense, intelligent technologies should contribute to what Arendt calls the ‘human life process’ (1958/1998, p.151), understood as a form of care for humanity that is more than a ‘collective of lone individuals’ (Stawarska, 2019). Thus, technological relatedness is articulated as a framework foregrounding social interaction as constitutive of interaction design and positioning itself as an alternative to the instrumental framing of technology.

In summary, the theoretical framework builds on technological mediation, which refers to a relationship with technology that emphasises how it shapes us and, following Latour (1992; 1994), how technological objects can operate as relays within society. Performativity allows me to identify narratives about technology that are often taken for granted, such as technology as a means of exercising power (Chapter 5), techno-solutionism (Chapter 6), or robot sociability (Chapter 8). Against these assumptions, I demonstrate that technological relatedness offers an approach to technology that engages the user through collective individuation (Simondon, 1958/2017), understood as influences, pressures or gestures.

3.6.5 Additional Frameworks

Due to the diverse themes introduced by the films in each chapter, I incorporate additional theories to further contextualise the props in relation to the issues they raise. This approach not only deepens the analysis of each prop but contributes to advancing the theory of mediation by exploring its application across technological and social contexts. In Chapter 5, to critically examine the use of things in training, I draw on the idea of the moral relationship with things (Latour, 1994; Verbeek, 2010; Pitt, 2014). In Chapter 6, to explore the notion of freedom from a relational perspective, I engage with Latour’s *Politics of Nature* (2004) and Mark Coeckelberg’s *Green Leviathan* (2021). In Chapter 6, Dr Strangelove’s glove opens up new possibilities for analysing and reconfiguring technology; here, I draw on Souriau’s (1943/2015) theory of instaurative dialectics for a closer examination of the relation between the actor and the performance prop. In Chapter 8, I use Suchman’s (2007) analysis of the humanness of machines, focusing on embodiment, emotion, and sociability, to capture the contribution of props to these dimensions. The

diversity of theories is only apparent, however, as they are all situated in relation to Latour's work.

Chapter Four

Creating a New Narrative about Technology using Film Props as Sources.

The aim of this thesis is to investigate the potential of intelligent technologies in terms of technological relatedness through the study of props in cinema. Envisaging the multiplicity of agencies (human and non-human) and ontologies (human and machine, prop and technology, real and fictional), I consider actor-network theory (ANT) to be my principal method. I deploy a mixed methodology of comparative object-network analysis informed by archival research, expressed in case study format. This chapter is structured in three parts. The first presents the main methodology, ANT, within the context of this research. The second formalises the process of identifying the performative relationship and translating it into technological relatedness, outlining three key stages: formation, speculative affiliation, and composition. The third introduces the secondary methods, including the use of the archive as an experience, and outlines the main sources consulted.

4.1 Object Analysis through Actor-Network Theory

Object analysis in this study is conducted through ANT, a framework originating from the domain of science and technology studies (Latour & Woolgar, 1979) which has received many contributions, such as those of Bruno Latour (1992; 2007), Michel Callon (1984, 1986, 2007), John Law (1999), Akrich (1992) and Annemarie Mol (2010). Occasionally, it is used in design (Shiga, 2007; Yaneva, 2009; Wilkie, 2019) and interaction design (Di Salvo & Lukens, 2011). According to Albena Yaneva (2009), an ANT approach to design consists of investigating the practice of designers rather than their theories or ideologies, focusing on their actions rather than their thoughts. For this reason, the pragmatic content of actions, not the discourse, is prioritised, focusing on the design in the making rather than the design made. ANT scholars seek to describe what they observe in close or ‘thick’ detail (Latour, 2007, p.138) in order to reveal the local mechanisms by which associations are realised, and networks built.

ANT contributes to the construction of alternative stories by specifically highlighting the influence of the non-human as the production unfolds. It enables a focus

on less visible elements such as the mediation of objects, whether as performance props or as enacted technologies. To achieve this, a descriptive approach is required, where technology is examined in terms of its influence and as a means to isolate a modern paradigm, such as the instrumentalisation of technology. According to Mol (2010), ANT ‘helps to tell cases, draw contrasts, articulate silent layers, turn questions upside down, focus on the unexpected, add to one’s sensitivities, propose new terms, and shift stories from one context to another’ (p.253). Mol sees this framework as a tool for telling alternative stories that diverge from the usual narratives of power, instead revealing the role of non-humans or objects in shaping social life. Similarly, Law (1992) describes ANT as ‘a way of suggesting that society, organisation, agents and machines are all effects generated in patterned networks of diverse (not simply human) materials’. Thus, this framework is used as an empirical tool in order to reflect on existing relations and find new relations between people and technology through the formation of a technical object where the role of the object (the actant) is co-constitutive of the user (the actor).

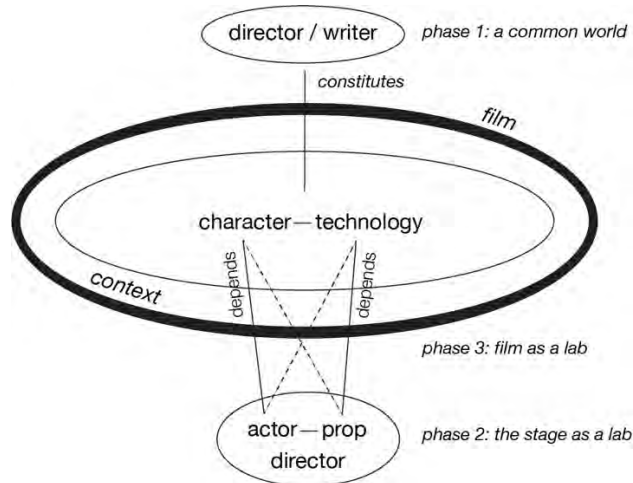
4.1.1 The Stage and the Film as Laboratories

The application of ANT to the analysis of film has been explored before (see Spöhrer, 2017; Sonnenberg-Schrank, 2020) with the predominant focus on the apparatus of cinema and its role in the mediation of the image. My approach differs slightly as I focus on the mediation of the object in the film, whether it is a prop on stage or as enacted technology in film as an existing space for technological experimentation. I conceptualise the stage and film as laboratories to investigate the role of props, their mediation, and their function as technologies in development (Figure 4.1). This approach frames film as a site of invention and innovation rather than a producer of cultural elements. The notion of the laboratory is celebrated in early ANT (Latour & Woolgar, 1979) by reframing scientific facts within the social and relational dynamics of scientists in the lab, demonstrating that the production of facts is influenced by numerous external factors, not all of which are scientific. Similarly, I approach cinema by removing its aura to focus on technological props as relational entities embedded in networks of interaction. While the primary influence of the director and writer is acknowledged during the initial world-building phase (phase 1), their vision operates as a negotiation with existing realities, what I refer to as a common world. The set functions as a laboratory where technology is assembled (phase 2). Only later does the outcome of this process emerge on film (phase 3), shaping the public’s perception of these technologies. The film envelops the stage, shielding it from the

context of the production, and when the actor and prop enter the stage, they become the character and the technology.

Figure 4.1

Three phases of materialisation of the prop: the director and the writer create a common world (1); the actor-performance prop work it out on the stage with the director (2); and the result is another lab where the character-technology finally emerges (3).

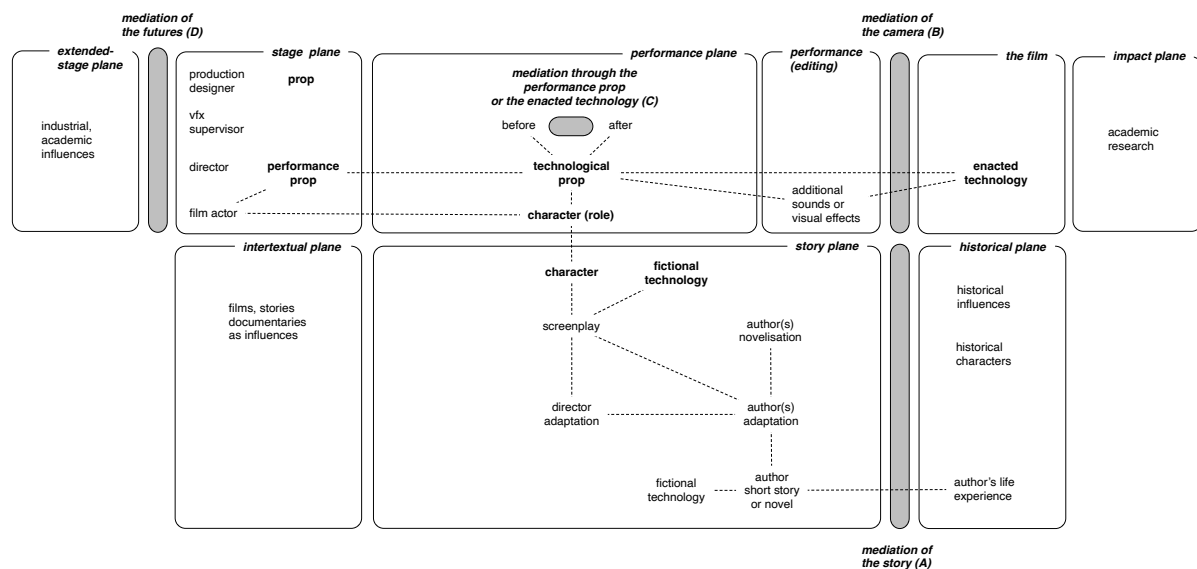


This approach is constrained by the absence of access to the film set. In order to compensate for the lack of first-hand observation, the documents at the Stanley Kubrick Archive (SKA) are used. They include multiple versions of the scripts, up to and including the shooting scripts to understand the type of decision made. Even so, this might not provide sufficient information, so documentaries (including the making-of) and interviews with the social actors (film actors, writers) supply more insight into the practical issues resolved on the stage. However, caution should be observed in this approach. Latour (1996) warns that ‘the account of a fabrication is somewhat more difficult, since any one of the figures may move from text to object or object to text while passing through every imaginable ontological stage’ (p.81). He suggests that the process of making an object and the narrative describing that process may not tell the same story. In this case, there are two fabrications to consider. The first pertains to the making of the film itself, including the props, which is often obscured by the aura of the film. I posit that, unlike technological innovation, archival research of films can provide a clearer understanding of what truly transpired on set since this information was not planned to be released (see Chapter 8 on the provenance of HAL, for example). The second fabrication concerns the technology depicted on screen. I argue that the enacted technologies are perceived for their dramatic value rather than their technological value. Another caution Latour (1996) mentions is that, in order to follow a technological project, ‘we have to follow simultaneously both the narrative program and the degree of “realisation” of each of the actions’ (p.81). The

narrative program Latour refers to is the presentation of the technology as it was planned in contrast to what is done effectively. I argue that this caution does not apply to fictional technologies, which are solely intended to warn us of the potential consequences of their use (see the section on speculative affiliation).

Figure 4.2

The section narrative aids in identifying the mediation of the object and offers an alternative narrative distinct from the film.



For every case study, I devise a unique approach to ANT tailored to the specific needs of my research. I refer to this process as a section narrative (Figure 4.2), in which I highlight the mediation of the prop as an enacted technology in the film (Chapters 5 and 8), performance prop on the stage (Chapter 7), or both (Chapter 6). Through archival and literature research, I trace the films' development across multiple planes of discussion. The aim of these planes is to uncover a new narrative centring on the relationship between the actor and the performance prop (in the performance plane) or the character and the enacted technology (in the film plane). This alternative approach reveals uncertainties surrounding film production and may include actors' opinions (Chapter 5), stage events (Chapter 6), historical voices (Chapter 7), external influences (Chapter 8), or a combination of these which leads me in my choice to focus on the stage, the film or both. Assembled in this way, the section narrative presents other stories and networks that emerge from the relation with the object, uncovering new potentials for technology through the lens of relatedness.

During the research, I have identified 9 planes of discussions. The stage plane, the performance plane and the film plane are particularly crucial in the analysis, as they show

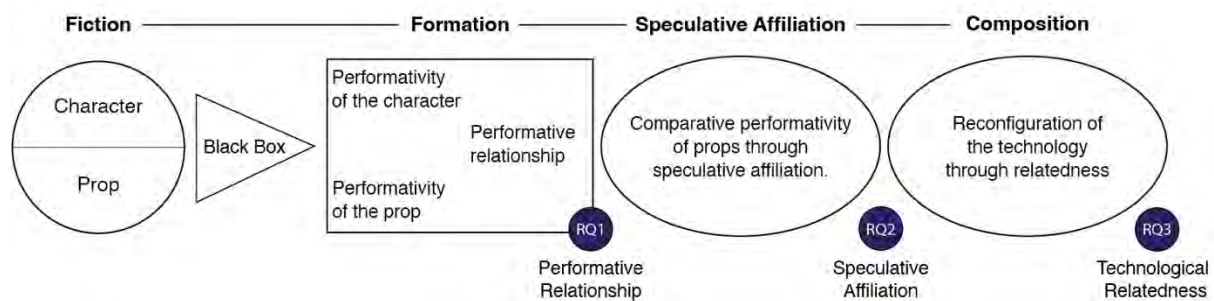
the mediation through performance prop or an enacted technology. This is where the performative relationship is identified. The story plane is where the story takes shape from an existing novel chosen by Kubrick and the authors hired to develop adaptations or original stories based on their short stories. An adaptation can have multiple authors working on specific versions of the story, such as the addition of the story of Pinocchio to *A.I. Artificial Intelligence* (Chapter 8). When the script is finished, it can be turned into a novel, such as Arthur C. Clark's *2001: A Space Odyssey*, or used to create new novels such as Arthur C. Clark's *Odyssey* series, which gives new resolution to the story. Additionally, the author might have further commentaries on the origin of the prop, such as Arthur C. Clark's *The Lost Worlds of 2001*. In the story plane, I refer to the prop as a fictional technology as it may appear in the original novel (the rifle in *Short Timers*, the Ludovico Treatment in *A Clockwork Orange*, David and Teddy in *Super-Toys Last All Summer Long*) or as part of the story development (HAL in *2001: A Space Odyssey*, Gigolo Joe in *A.I. Artificial Intelligence*). Exceptionally, the prop appears on the stage as an improvised solution for the actor, such as the glove in *Dr. Strangelove*.

The stage plane is composed of 4 planes. The first is the stage itself where the performance is planned, and the props are prepared by the production designer. It is where the prop becomes a performance prop as the actor starts using it. The second is the performance plane, where the prop and the actor converge to become the technology and the character. It is not a physical space, but rather a conceptual space in which all elements align toward the making and enactment of the prop. The prop is rarely a completed object by then, as the third element of the stage is the post-production, such as the voiceover of HAL in *2001: A Space Odyssey*. A fourth element of the stage is the influence of consultants, such as in *2001: A Space Odyssey* and *A.I. Artificial Intelligence*, who sway the director as part of the extended stage. This is another form of mediation, where the future of a technology is in the hands of people external to the film production (see Chapter 8). Once off the stage, the film plane shows the consequences of the use of the technology, the enacted technology shows the outcome such as an advanced social robotics in *A.I. Artificial Intelligence* (see Chapter 8). Finally, the historical and the intertextual planes show the influence of historical reality and other fictions onto the movie. For example, in Chapter 7, I discuss a challenge on the performance plane, where the actor Peter Sellers struggled to connect with many historical characters.

Through ANT, I conceptualise human and object as a collective, both acting as sources of influence within a symmetrical framework. This perspective shifts the focus of my research towards the relationship between the user and the object as a site of technical innovation, rather than concentrating solely on the object's fabrication or intended use. As a methodology, ANT also frames technological innovation as a form of fiction, existing initially in the imagination of the creator (Akrich, 1992). My approach embraces this view, positioning the stage and the film as laboratories for innovation, while placing particular emphasis on the consequences of technology as it unfolds within these fictional yet materially grounded spaces.

Figure 4.3

Design as a Translation



4.2 Design as a Translation

Reconfiguring technological props into technological relatedness necessitates a new approach to design (Figure 4.3). I draw on Latour's methodology of technical description (1994), particularly his concept of translation. Law (1992) describes it as 'the possibility that one thing may stand for another'. It posits that non-human entities, such as technologies or artifacts, actively participate in and shape social interactions.¹ Similarly, my perspective is to translate the existing relationships with *performance props* or *enacted technologies* into a new social relationship with intelligent technologies. Because these relationships are often extreme, they cannot be directly adapted without careful consideration. The translation process involves: 1) identifying the pre-existing scripting of the technological prop or the characterisation of the user; 2) establishing a speculative affiliation with other props to

¹ Latour (1990) gives the example of a hotel key which the owner wants returned. Attaching something heavy or oversized to a key prevents people from carrying it away with them. This approach resolves a social issue by modifying the object.

uncover the underlying social issue and 3) the composition of a new prop that reconfigures the relationship into an object that connects the individual with the collective.

4.2.1 Formation

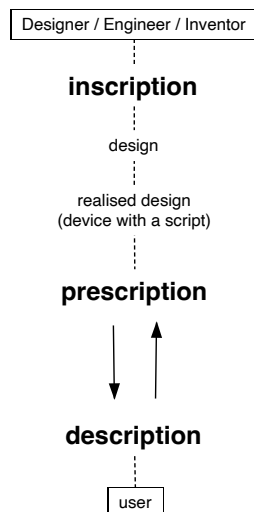
The formation begins with the analysis of the performance prop and the actor or the enacted technology and the character by examining the constitutive influences that shape them. I apply ANT to trace the various factors that have shaped their separate development. This analysis enables the construction of a new narrative, referred to as a section narrative (Figure 4.2), which focuses on reimagining the relationship with the object, moving beyond its filmic context and towards a new configuration. The analysis is done through the concept of scripting (Akrich, 1992) which ‘defines a framework of action together with the actors and the space in which they are supposed to act’. I use scripting to analyse technological props as designed objects for the stage and the screen. It is a process of co-construction that begins with the object and reveals various phases of development, including inscription, prescription, and description (Figure 4.4). The inscription is the design of the object as a plan that leads to a realised design, a device with a script. Once the object is realised, it prescribes certain actions to the user; this constitutes the prescription. Ultimately, the user decides to read the object in their own way through the description of the object. In films, what is inscribed in the object by the writer or director is not always described in the same way by the film actor. An example of this is found in Chapter 7, where the glove is a costume accessory but described as a prosthetic by the actor, Peter Sellers, then further improvised into a mechanical arm during the performance. As the scripting of objects is integral to the research, I also consider the scripting of characters in a similar, symmetrical manner. I therefore refer to this process of co-production between the writer, director, production team, actors, and consultants as *characterisation*. It is not only a process of creative inscription but also involves prescription (the object) and description (the actors).

The final step of the formation focuses on the performative relationship. Films often present the prop and the character through classical representations of relationships such as care or power (see Chapter 5). The performative relationship refers to a key moment that may not be central to the film’s narrative but nonetheless reveals a specific mode of interaction with the technological prop. For example, it may reveal a form of soft influence in the relationship with the rifle (Chapter 5), a common articulated through pain (Chapter 6), a momentary control of the user (Chapter 7), or the relationship between two

robots through a shared cosmos (Chapter 8). Although these moments may appear minor in terms of dramatic intensity, they constitute an important source for the reconfiguration of technology, as they reveal new possibilities for relationships with intelligent technologies.

Figure 4.4

Inscription – Prescription – Description



Note. Adapted from Akrich (1992)

In the formation, I seek to construct a new narrative that centres on the mediation with the technological prop by investigating the influences that shaped both the character and the enacted technology. Evidence emerges from within the film, such as the violence inflicted on Alex (Chapter 6) but may originate in real-world events, such as a violent episode experienced by the author and his wife, which was extended in the film through the act of revealing the author's name on a prop (also Chapter 6). This part of the research serves as a platform to examine the enacted technologies and the characters by tracing their origins, ultimately leading to the identification of the performative relationship.

4.2.2 Speculative Affiliation

Technical mediation is a methodology for the analysis and composition of technological objects, but it does not account for the analysis of fictional objects. To deal with this specificity, I draw from an additional method developed by Suchman (2005) called *affiliation*. Suchman mentions this technique as a mode of innovation based on her experience at the Xerox Park, when a photocopier they had developed was brought back to the company to be reinvented. According to Suchman (2005), 'the photocopier could not be an object that was of interest in its own right; it was of interest only as a vehicle for the

pursuit of other things' (p.387). She notes that the photocopier's 'failure as a quotidian object laid the grounds for its reinvention as an object of scientific research' (Suchman, 2005, p.393). This contrasts with the design approach, highlighting the potential of an existing object through the study of technology within its context, while also presenting opportunities for further research through the object itself. From the perspective of ANT researchers, the affiliation is a 'suggestion for further—comparative and contrastive—investigation' (Mol & Law, 2002, p.15). Indeed, Suchman's affiliative approach is notably pragmatic, focused on delivering real-world outcomes. However, I propose adapting this approach into a speculative-pragmatic method, in which the object is examined for its critical potential by studying similar props in science fiction, while considering the consequences of the object's actions on humans.

In design, the speculative approach is mostly attached to the practice and writings of Dunne & Raby. It opens new avenues, particularly in dealing with technology critically and engaging with alternative futures. As seen in the literature review, props are a key element of speculative design, which let the audience engage with other futures (Dunne & Raby, 2013). That said, speculative design also has some drawbacks. Cameron Tonkinwise, for example, criticise speculative designers for their inability to think of the future in its complexity, not just as an aesthetic of the sensational (Auger, 2019). In contrast, Didier Debaise and Isabelle Stengers bring a new perspective that partially overlaps with speculative design, in the sense of 'an intensification of the sense of the possibilities' (Debaise & Stengers, 2016). However, unlike speculative design, their approach places greater importance on the consequences of these possibilities, advocating for 'the accountability of an action or an idea' (Debaise & Stengers, 2016). This research is speculative in the sense that it reconfigures a fictional object into reality as a matter of concern, for its ability to embrace a stronger social responsibility. This process requires translating the new object by attending to the consequences introduced by the old one, an approach aligned with Stengers' notion of a 'care of the possible' (Bordeleau, 2011, p. 12). Thus, the speculative affiliation is the act of isolating a prop and comparing it with others based on its ability to address a specific issue in the future. The speculative-pragmatic perspective applied in this process involves engaging with the consequences, as a care of the possible.

4.2.3 Composition

The final stage of the study is the *composition*, where I gather the key learnings from the formation and the affiliation to reconfigure the object within the framework of technological relatedness. When the outcome is important, some designers find ANT limited (Michael, 2018; Wilkie, 2019) or even 'poor' at addressing ethical considerations (Waelbers & Dorstewitz, 2014). However, I argue that composition is key to Latour's mediation, and central to a Latourian theory of design (see Di Salvo, 2018). Rather than seeking a solution, it involves engaging in a process that Latour (2010) describes as 'composing the common world from disjointed pieces' (p.485). This stage is crucial, as it involves developing the agency of non-humans such as intelligent technologies in this case. Understanding props and reconfiguring the technology they represent allows me to acknowledge their social role so as to create better intelligent technologies. For Latour (2010), design is a process of de-composition (removing the issues of modernism, for example) and re-composition (reconnecting with nature, for example). A similar process is applied here, where a weapon (Chapter 5) or an instrument for re-engineering the human (Chapter 6) is de-composed to examine its instrumentality then re-composed into technological relatedness.

Latour's concept of technical mediation (1992) provides a useful framework for understanding how technical objects mediate human action. A key element of his approach is the notion of translation, which involves resolving a social issue by assigning a plan of action to an object. I expand on his approach by enabling the transition from a technological prop to an intelligent technology. Since the issue is rooted in our broader approach to technology, it necessitates a more complex, multi-step process. It is first established within the film, following the identification of the black box such as a soldier's suicide (Chapter 5). From there, social actors are mapped through the formation of the issue, where both human and non-human influences are examined symmetrically. For example, Chapter 5 shows that most relationships are instrumental. Their mobilisation is subsequently examined through a more symmetrical relationship between user and object, that I define as a performative relationship. A distinct step I introduce is the speculative affiliation of the object where the technological prop is compared with other similar props that attempt to address similar issues. This enables the identification of broader social issues, such as the morality of technology (Chapter 5), which demand further analysis in both practical and theoretical terms. Finally, the composition of the

object is the final part of the translation process where the impact of the object is carefully composed by considering a new role in society.

This method operates within the theoretical framework of mediation theory to conceptualise a new social role for technology. It uses the theory of performativity, positioning the prop as an object in development (Suchman et al., 2002) that interrogates our current relationship with technology (Bhabha, 1994), and the theory of transindividuality (Simondon, 1958/2017) to support the development of intelligent technologies as social agents. The addition of transindividuality demonstrates a form of relatedness that extends beyond the direct use of technology by the user (Figure 4.5).

Figure 4.5

Research Methodology in relation to the Theoretical Framework

	Theoretical Framework	Method
1. Formation of the actor and the prop	Performativity	Actor-Network Theory
2. Affiliation of the issue through other props	Performativity	Speculative Affiliation
3. Composition into intelligent technology	Transindividuality	Composition
	Mediation Theory	Design as a Translation

4.3 Secondary Methods

4.3.1 Archive as an Experience

The Stanley Kubrick Archive (SKA) at the University of the Arts London allows access to the development of the films through letters (Chapter 8), memos (Chapter 7), various versions of the characters (Chapter 5 and Chapter 7 in particular), scripts (Chapter 7 in particular), omissions (Chapter 6), and objects and clothes that animate the films (Chapter 5). They do not replicate the experience of the director or the actors but show that the production of the film is not linear and keep us grounded in the reality of the production.

ANT suggests an empirical approach to research, so as to avoid the usual story of how technology comes to succeed or to fail. According to Latour (1992), it allows us to retell stories in terms of social practice rather than technological practice. An empirical

approach does not normally include archives, as it is the place where ‘the innovation turns back into a text, a technological fiction’ (Latour, 1996, p.24). The fiction referred to here is the archive as place where the narrative of a certain technology is fixed. In the archive, the technologies in the movies are not the central preoccupation, so the risk of rewriting is limited. The film is the sensational element where care must be taken about the tendency to create fictions. Chapter 7 is a good example that shows the many opinions of the secondary sources, who often create their own stories about the provenance of the prop.

Archiving, as an experience, recognises the veracity of documents about the production of the movies. Unfortunately, documents are often not sufficient to retrace the full experience which is the concern of this research. The fiction, through the archive, is not as close to the interview, but gives an idea of the social practice of making films and helps reconstruct the experience and objects used. Multiple resources give a better view of the experience of filming and inform the research. The SKA is only one of the constitutive elements of the experience of filming and constructing objects. The films, making-of documentaries, and interviews with actors are ‘immutable mobile’ documents (Latour, 1986), which can be reliably reproduced, distributed and reviewed as a kind of eternal ethnographic document. This does not mean that a film necessarily relates real events, or that the actors are able to freely express their ideas on camera, but that the document does not change. In this regard, it is also an archive.

4.4 Sources

The Stanley Kubrick Archive

The main resource for this research is the SKA. It provides detailed progress of the movies from the various stages of preproduction (script writing, character development) and production (order of shooting, characters and the objects present or omitted from the prop list), while also showing alternative or discarded ideas. After the death of Stanley Kubrick in 1999, part of his estate was donated to the University of the Arts London (UAL), and divided into two parts, the Stanley Kubrick Archive located in the London College of Communication and the Kubrick Exhibition which travels the world. I visited the first on many occasions and had the chance to visit the exhibition at the Design Museum in London in September 2019. Both the archive and the exhibition contain props, but the exhibition has some of the more spectacular props such as a replica of HAL. The exhibition also contains some original documents which are not in the SKA (see Chapter

8). This is unfortunate, in my opinion, as I would have hoped they would keep a copy of the documents in the archive, along with photographs of the props, in the hope that they might one day return to the collection. I accessed the archive at the beginning of the writing process for each chapter, constructing a timeline of events leading up to the film's production, often including the shooting itself (Chapter 7). This process led to the development of the section narrative as a new way of structuring each case study. The main difficulty in researching the SKA is that no pictures can be taken, only notes on a computer. However, they have allowed 20 copies of pictures and documents to be included in the thesis which are marked by courtesy of the Stanley Kubrick Archive.

Visual Resources

The films themselves serve as important resources, illustrating the potential consequences of using certain technologies as if they were real. For example, in Chapter 5, soldiers are progressively initiated into the use of their rifles as part of their training, but Private Pyle ultimately turns his weapon on himself and his sergeant, demonstrating the extreme consequences of this process. Technology is initially presented as simple, yet its application can lead to unforeseen consequences. Other visual resources, such as set photographs, making-of documentaries, and interviews with actors (including promotional material), provide first-hand accounts of the actions and challenges faced by both actors and crew during the films' productions.

Chapter Five

Private Pyle's M14 Rifle: Technological Relatedness through Training



Note. [Film Still] Kubrick, S. (Director). (1987). *Full Metal Jacket* [Film]. Stanley Kubrick Production and Warner Bros.

In this initial case study, I examine the concept of technological relatedness through the lens of training. The conventional understanding of training typically focuses on improvement, revolving around either the people or a machine. According to Donna Haraway (2008), training puts ‘the participants inside the complexities of instrumental relations and structures of power’ (p.207). Examining the film *Full Metal Jacket* (Kubrick, 1986) (hereafter *FMJ*) provides valuable insights into the challenges of training. The military training amplifies the issue of instrumentalisation by blurring the boundaries between human and object, emphasising the efficiency and resilience of the soldiers. Instead of focusing solely on the technology or the user, I propose reconceptualising training as a mode of engagement with the collective, involving both the user and the intelligent machine in establishing technological relatedness as a process of co-individuation. Examined through Simondon's theory of transindividuation (1958/2017), I conceptualise intelligent technologies as relays that connect individuals in their ongoing processes of individuation, through instauration with technology, contributing to the formation of collective habits. The research focuses on Private Pyle, a key character in the film, who struggles to train alongside others and ultimately breaks down, revealing the limits of training in a system that demands the instrumentality of the human.

The prop, an M-14 training rifle, is examined for its thematic and situated qualities. Thematically, it raises critical questions about the role of technology as a means of influence, beginning with its function as a tool of violence and extending to broader questions of technological morality. As a situated object, I examine the prop as an enacted technology that contributes to the individuation of the character within the film. The motivation for investigating this technological object starts by identifying the black box. The killing of his sergeant, followed by the suicide of Pyle, exemplifies an extreme case where the training has catastrophically failed. While Pyle, the rifle and their association are the cause, the film offers an opportunity to question the influence of the training. The research seeks an understanding of technology that is performative, initially through analysis and subsequently as a key question, employing the concept of a performative relationship. The film is performative in conveying the idea that military training should be rigorous, but Kubrick presents an alternative ending, using the suicide of Pyle as a means to attenuate the desire to go to war. It showcases the influence of the rifle and the training in mechanising young soldiers. This specific characterisation of the soldier as a machine of war offers a unique opportunity to examine their relationship symmetrically, positioning the rifle as an equal partner alongside humans. For the characters, the

dynamic begins as a power relationship with the sergeant trainer, then shifts to a relationship of care with a fellow trainee. While most films might stop there, this narrative takes an original turn by introducing a distinct and evolving relationship between Pyle and his rifle.

This chapter demonstrates that training is key to defining intelligent technologies in terms of relatedness. In the section relative to the formation, I firstly analyse Pyle as an object-in-making through his characterisation, exploring the dynamics as relations of power and care (Section 5.1.1). Then, I analyse the rifle on stage, focusing on its role in training the actor as a stage rifle, in contrast to its function in the film as a cinematic rifle (Section 5.1.2). I demonstrate the performative relationship (RQ1) through the application of the *Marine Creed*, a collective statement of commitment that emphasises the close bond between the US Marine and their rifle (Section 5.1.3). The analysis leads to an initial discussion tracing the origin of the Marine Creed to the history of military training between the Second World War and the Vietnam War. While most training methods during this period aimed to desensitise soldiers to the use of lethal force (Grossman, 1995), the Marine Creed presents an individuation through training foregrounding the relationship between the soldier and the rifle (Section 5.1.4).

In the section relative to the speculative affiliation of the prop (RQ2), I focus on the rifle and how the use of lethal force is addressed in science fiction in order to research alternative forms of technical relationships (Section 5.2.1). This leads to a second discussion in which the issue is explored by analysing the mediation of the rifle in moral terms, demonstrating that monstrosity, a term attributed to Pyle's character in the film, is not inherent in the soldier or the gun, but rather a consequence of the training itself. This analysis shifts the focus to the conditions that shape their interaction, revealing how instrumentalisation transforms both the soldier and the weapon into mere extensions of military efficiency (Section 5.2.2). In the third section on technological relatedness (RQ3), the rifle recedes to foreground a broader configuration of interaction. Mediation is traced through training as a transindividual process that resonates with wider social consequences (Section 5.3.1). As an example, I explore the application of relatedness through training by presenting a smart object that deliberately disrupts infrastructural convenience, requiring users to wait during periods of high demand in order to foreground their participation in the infrastructure (Section 5.3.2). In this chapter, I use the Stanley Kubrick Archive, the actor Matthew Modine's published diary, the novel *The Short-*

Timers (1979) by Gustav Hasford, the film itself, and the many visual and written references on the film.

5.1 Formation: Private Pyle and his Rifle

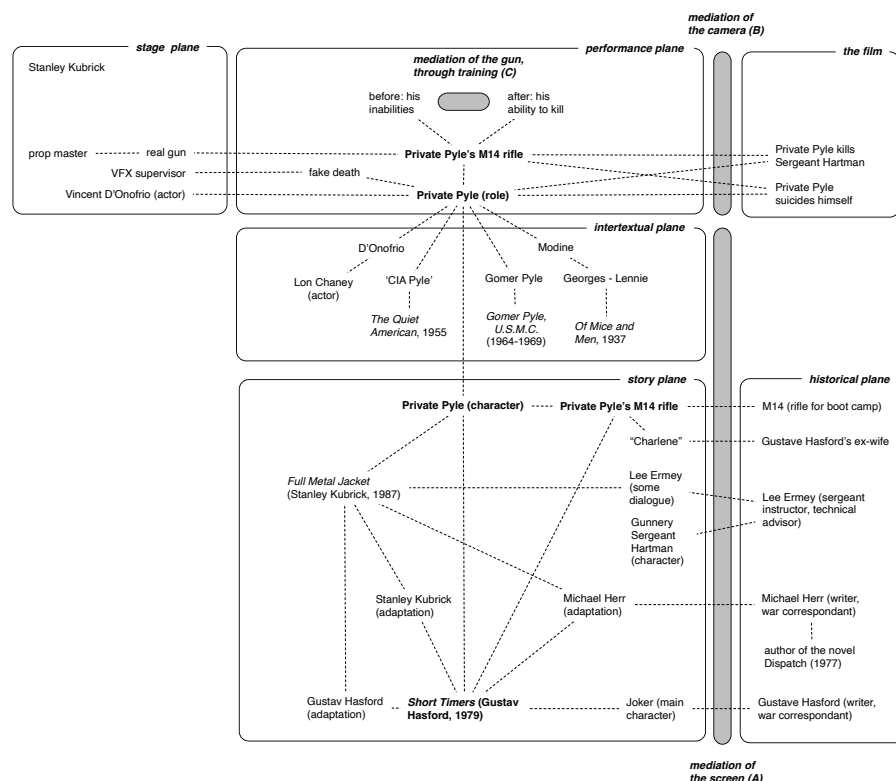
Soldiers present an intriguing subject of study, as they not only undergo training to master their tools but also learn to function as instruments themselves. Throughout, I adopt a symmetrical approach between humans and objects, facilitating a shift to a relational perspective with intelligent technologies. I start with characterisation of Pyle. He received minimal inscription from the authors so as to invite multiple descriptions from the actors. I explore these dynamics from the film as relations of power and care before exploring another description as *a third force* that demonstrate its ability to influence the other trainees after his suicide. I firstly analyse Pyle through his relationships with his sergeant, the trainer, and Joker, a trainee assigned to care for him. In the following section, I examine the rifle on stage. The weapon is both a stage prop that helps the actor transform into a character and the cinematic weapon shows the real abilities of the rifle and the consequences of its use. Using ANT, I examine how these social actors come together and particularly how Pyle's rifle becomes an alternative to the relationship with his companions. Pyle is told by his trainer that the rifle is merely a tool (scene 27), but it is also characterised as a friend (scene 7, 49) until he is instructed to become 'one with the rifle' (scene 8). I argue that these pivotal moments serve as the foundation for a performative relationship (RQ1) wherein the Marine Creed (scene 8) acts as a transformative force that elevates the rifle from a mere tool to an object with which Pyle must merge to ensure his survival. This performative aspect underscores the profound influence of the training process on the perception of the rifle. In the discussion, I examine the origins of the Marine Creed as a response to the issue of soldiers refusing to aim or shoot when confronted with the enemy.

The formation is the first element of the translation method which situates the performativity of the social actors in the film. In this context, the focus is on the actors and their description of the character of Pyle that completes the inscription of the authors. The section narrative of *FMJ* provides the elements to build an alternative narrative focusing on the mediation of the rifle (Figure 5.1). The characterisation of Pyle is found in the story plane, the intertextual plane and the stage plane. While it is expected that most of the characterisation is shaped by the writer and the director, much of the description of Pyle

was also developed by the actors. Vincent D'Onofrio, who plays Pyle, perceives him as a monster whereas Matthew Modine, who plays Joker, interprets him as a mentally disabled man. In this case, the focus is multifaceted, with the intertextual plane serving as a key juncture between the story plane and the performance plane, firstly as place to decode the personality of Pyle through its naming, then an alternative reading using the concept of third force, as explored in the novel *The Quiet American* (Green, 1955). The stage plane is used to discuss the various functions of the gun in relation to the actors but also the gap between stage and reality. Although the film is a work of fiction, it maintains numerous connections to reality. For example, both the writer, Gustav Hasford, and the adapter, Michael Herr, were war correspondents during the Vietnam War, providing them with first-hand experience.¹ Hasford projects himself into the character of Joker (Webster, 2011), which is crucial to understanding the relational dynamics and influence of Joker on Pyle. Actor Ronald Lee Ermey, who portrays Sergeant Hartman, was a real-life drill instructor and contributed to the dialogue through his own improvisation (LoBrutto, 1997), which amplifies the impact of the training.

Figure 5.1

The section narrative shows the planes that contribute to the mediation of Private Pyle's and the M14 rifle.



¹ Michael Herr is a journalist who wrote the novel *Dispatch* (1977) about the war in Vietnam.

The sources for the formation include the original novel (Hasford, 1979), the pre-script given to the actors (SK/16/1/20), the post-script (SK/16/1/21) and the deleted scenes (SK/16/1/4) from the SKA archive, the published script (Kubrick & Herr, 1987). It also includes the published diary of the main actor (Modine, 2005), which provides insights into the characterisation of Pyle. For the analysis of the rifle, I examine the props available at the SKA, including a dagger (SK16/3/2/7) and a hand grenade (SK/16/1/4). I trace the provenance of the rifle through trade booklets for army and navy surplus suppliers (SK/16/2/3/20) housed at the SKA. Additionally, I explore the impact of the rifle through Modine's diary (Modine, 2005) and continuity images of R. Lee Ermey and Vincent D'Onofrio (SK/16/3/29) at the SKA.

5.1.1 Looking for 'Private Pyle'

Hartman to Pyle: 'What is your major malfunction, numbnuts?' – *Full Metal Jacket*

Although Pyle is not the central character in the film, he plays a pivotal role in the first part. Following his suicide, his influence extends beyond his presence, shaping the other characters' relationships to war. I examine Pyle's characterisation from a relational perspective, as the simplicity of his character renders him easily defined by the actors. In the story plane, he is inscribed through classic relational dynamics, such as power and care. While power is self-evident in the context of military training, care is embedded in a system that requires deeper consideration. The development of Pyle allows me to critically examine these classical approaches in contrast to a relational perspective, in which I present the actions of Pyle and his rifle as a relay for the film's anti-war sentiment. On stage, the focus shifts to the development of his identity by the actors as little detail is given in the film script. The actors draw on literary references in which care becomes a burden, and on cinematic representations of monstrosity, both of which are key to shaping the development of Pyle's character. However, Pyle's suicide represents the moment of greatest impact, acting as a third force, a relational force, for the people around him rather than a representation of disability or monstrosity as stated by the actors. By examining this perspective, this section allows me to reconceive training in intelligent technologies in a critical way, focusing on technology as a relay rather than reinforcing conventional relational dynamics.

The two first relationships are presented in the film. The first is a relation of power between his trainer, Gunnery Sergeant Hartman, and Private Pyle. The second is the relationship between Private Joker and Private Pyle, which I characterise as a logic of care. I argue that, ultimately, both embody similar forms of instrumentalisation, despite being presented differently. The Hartman-Pyle relationship exemplifies the power dynamics typically seen in the military, a theme frequently portrayed in films. When Private Leonard Lawrence starts his training, the first exchange with his sergeant involves being given the name ‘Gomer Pyle’,² a reference to an army recruit in a TV series in which an abusive sergeant is also present (Figure 5.2 and 5.3). Hartman addresses Pyle with a question: ‘What is your major malfunction, numbnuts?’ (FMJ, 1987), as if a human were capable of malfunction like a computer.³ The expectation is for the soldier to become a machine, a notion shared with William Mares who describes the purpose of the first week as ‘to diminish and exorcise all civilian patterns of behaviour’ (Mares, 1971, p.25). This authoritarian relation has only one goal, to normalise the training as a relation of power.

Figure 5.2 and Figure 5.3

A tale of two Pyles



Note. Left: [Film Still] Bullock & Ruben (Director). (1964-1969). *Gomer Pyle U.S.M.C.* [TV Series]. Ashland Productions & T&L Prod. Right: [Film Still] Kubrick, S. (Director). (1987). *Full Metal Jacket* [Film]. Stanley Kubrick Production and Warner Bros.

The second relationship in the film is initiated by Hartman as an attempt to find an alternative approach to Pyle, acknowledging that he requires additional care. This represents a turn from authoritative power to soft power, but maintains the instrumental role of the soldier. Annemarie Mol (2008) calls this a logic of care, emphasising the adaptability of the system to responsibility rather than necessity. The care is instrumental,

² The reference is to a fictional character played by Jim Nabors² in *The Andy Griffith Show* (CBS Productions) and his own spin off, *Gomer Pyle, U.S.M.C.* (Bullock & Ruben, 1964-1969).

³ Patrick Webster sees this line as ‘an internalized Kubrickian reference to HAL’ (Webster, 2010, p.133). This reading justifies beginning with Pyle in the first chapter and concluding with HAL in the final one.

as it is directed towards doing things better, passing the test, whereas good care for Pyle would have dismissed him from the training. In the film, the sergeant assigns Joker to take care of Pyle. Hartman is rather dismissive at the beginning, telling Joker, ‘teach him everything, he will teach you how to pee’ (Kubrick & Herr, 1987, p.23), but Joker starts to care for Pyle, working him through the training requirements such as the disassembly of the M-14 gun (Figure 5.4), the lacing of his combat shoes, the confidence climb (a 10-meter ladder) and other tasks such as drilling in scenes 20 to 26 (Kubrick & Herr, 1987). The care Joker gives Pyle helps him survive the difficulties of training. The novel goes further, as he teaches Pyle not only skills but also the values of the Marine Corps: ‘Marine run, Marine hump, Marine work hard, Marines are clean’ (Hasford, 1979) which includes the rifle: ‘Value his rifle as he values his life’ (Hasford, 1979). The logic of care is revealed to be a just logic when Hartman discovers a doughnut in Pyle’s footlocker (Kubrick & Herr, 1987, p.32-33). Following the discovery, the platoon is punished for not caring for Pyle and Joker decides to take revenge on Pyle. In the film, Joker cares about Pyle because the military training is unable to do so, without ever asking whether Pyle truly belongs in the military. The classic approach to care reveals its limitations as the end goal ultimately takes precedence over the meaning of care.

Figure 5.4

The relationship between Pyle and Joker (Scene 20)



Note. [Film Still]. Kubrick, S. (Director). (1987). Full Metal Jacket [Film]. Stanley Kubrick Production and Warner Bros.

While the film carefully develops the characterisation of its main character, Joker, the characterisation of Pyle enables a broader and more fluid representation of his role

within military society. Using Akrich (1992) concept of scripting, there is an absence of clear inscriptions in the characterisation Pyle which creates space for greater interpretation by the actors. This openness does not necessarily resolve the complexities of their roles. To describe this lack of characterisation, I begin with the presentation of the character of Gomer Pyle in the TV series: 'Gomer, I gotta admit, I can't figure you out. I don't know if you are a moron, dumb, or chicken' (Ruskin, 1964). Pyle is ultimately whatever is easiest to bully, as reflected in his various characterisations by the authors: 'oat-fed innocence' (Hasford, 1979), 'a tall, overweight boy' (SK/16/1/20), or as the actor describes him, an 'overweight country boy' (Modine, 2005). Further in the development of the script, Kubrick takes a different approach by defining Pyle by what he is not: 'He is not a dumb hillbilly' (SK/16/1/4). This remark, found in a working note, suggests that Kubrick deliberately chose to leave the audience uncertain about Pyle's true nature. In the following paragraphs, I explore this ambiguity.

Modine's diary provides valuable insights into the characterisation of Pyle, highlighting a perspective grounded in the constraints of care when it is no longer voluntary but perceived as a burdensome duty. While this viewpoint is understandable from the actor's perspective, it ultimately reinforces a predetermined dynamic, suggesting that the outcome of Pyle's trajectory is embedded in this relational framework from the outset. Modine uses Steinbeck's novel *Of Mice and Men* to describe his relationship with Pyle (Modine, 2005). The novel tells the story of a friendship between George, a witty, short man and Lennie, a mentally disabled, gigantic man. Modine built his character based on a relationship which is interesting, but very much unbalanced, equivalent to the care of a child in the body of a man. There is indeed something of *Of Mice and Men* in their relationship, which starts as a relation of care and ends with betrayal. Just as George kills Lennie in the novel, Joker initially hesitates to harm Pyle in the doughnut sequence but ultimately inflicts greater pain on him than the others (Kubrick & Herr, 1987, p.32-33). In Hasford's (1979) novel, he says: 'I beat him harder and harder when I feel tears being flung from my eyes, I beat him harder for it' (p.13). Modine's approach is certainly helpful from the perspective of the role but ends up showing that a relation of care is a fragile relationship.

D'Onofrio characterises Pyle through his final act, which leads to the killing of his Sergeant. The monstrosity of Pyle is another predetermined dynamic that distracts from the issues of power and care. In an interview with Kevin Pollak (2017), he talks about how

the image of Lon Chaney (Figure 5.5) helped him with the transformation, which he sees as becoming a monster.⁴ Similar to Modine, the characterisation is only useful for D’Onofrio, and does not reveal the social importance of Pyle. Mathew Modine recalls that Kubrick told D’Onofrio, the day before filming the final sequence in which Pyle takes his own life, that they shared the same reference (Modine, 2005). The two actors interpret Pyle differently. Modine sees him as a burdensome dependent, while D’Onofrio sees him as having a dangerous attitude. To shape their portrayals, they draw on visual and experiential references from literature and cinema, constructing mental images that inform their individual representations but do little to inform about his social role.

Figure 5.5

Lon Chaney plays the role of Marine Sergeant O’Hara



Note. [Film Still]. Hill G. (Director). (1926). *Tell it to the Marines* [Film]. Metro-Goldwyn-Meyer.

Pyle’s role can be explained through a relationship that is not directly inscribed in the character or articulated by the actor, but rather through an alternative perspective that reveals an influence extending beyond the narrative, one that may have shaped the very writing of FMJ. I posit that a character, also named Pyle, presents a view beyond the

⁴ Chaney was one of the first masters of make-up during the silent era. He was known for his facial expressions in his many roles as a monster such as Quasimodo in *The Hunchback of Notre Dame* (1923) or The Phantom in *The Phantom of the Opera* (1925).

classical perspective of power or care or the representation of the actors. In Graham Green's novel's *The Quiet American* (1955), a story also set in Vietnam, toward the end of the First Indochina War (1946–1954) in which French forces fought Viet Minh rebels, and two movies based on it (1958, 2002), Pyle is not a soldier but a CIA agent in plain clothes. He is in charge of destabilising the country by organising a series of terrorist attacks in order to blame the north Vietnamese and further the involvement of the USA in the war. This mastermind is the opposite of our Pyle, except for one thing, they are both a *third force* in their own reality, with one working as an amplification of war (the CIA operative) and the other as an inhibition of war (a suicide). Both Pyles create uncertainty and disorder around them, although their actions are very different. In *FMJ*, Pyle makes the other trainees rethink their relationship with training and war. The impact is global in *The Quiet American* while it is local in *FMJ*. The suicide only influences those close by, but creates a social impact which influences his fellow trainees, giving them a more reflective approach to war. This version of Pyle is the most relational interpretation of the character.

The formation of Private Pyle explores an object-in-making through a multitude of relations (historical, intertextual, personal identity) and types of relationship (power, care). At the beginning, the relation of power, embodied by Hartman, represents instrumentalisation in its most basic form. Hartman views Pyle as an object that must be made usable, yet he fails to meet that standard. The next relationship is one of care, as Joker is assigned the task of helping Pyle catch up. I argue that this is an illusion of care, where the logic of the training system ultimately supersedes and overrides Pyle's actual needs, such as his removal from the military. The actors' construction of Pyle's identity shifts the blame onto his character rather than the system itself. They focus on Pyle's simplicity, disability (inspired by Steinbeck's Lennie) or monstrosity.⁵ Instead, I argue that the character of Pyle is important for its ability to inhibit his fellow soldiers through his actions, his suicide in particular, which I find interesting in terms of relatedness. *FMJ* is often considered an anti-war movie (Donnelly, 2018) and the training sequence shows how manipulative actions can have unintended consequences for soldiers. The significance of Pyle's character as a third force lies in its ability to expose the hardships of military training while leaving lasting consequences on the soldiers around him. It is an application of the concept of relay, where a person acts with the intention of modifying the social environment. This section reveals the weakness of previous approaches to technology that

⁵ The theme of monstrosity is expanded on in section 5.2.3

see relationships with people in a too-literal manner and problematise training as a way forward.

5.1.2 Materialising the Rifle

‘A close up of a revolver is no longer a revolver, it is the revolver-character, in other words the impulse toward – or remorse for – crime, failure, suicide.... It has a temperament, habits, memories, will, a soul’ - Jean Epstein (Pantenburg, 2015).

The prop plays a relational role both on stage and on screen. On stage, it supports the actor’s transformation into character during performance. In the film, as a cinematic weapon, the rifle’s real capabilities are revealed. In both situations, it fills a gap in the engagement of the actor and the spectator. For example, the materiality and weight of the rifle help the actor grasp its physical presence, while the recoil provides insight into its agency. While these elements are crucial, the social role of the prop is often less considered, yet it is key to linking the weapon to the training.

Before encountering his rifle, Private Pyle is a less than ordinary character being bullied by his sergeant, beaten up by his fellow recruits and let down by his friend, Joker. The turning point is in in scene 39, where Pyle shows outstanding abilities during his training as a marksman (Figure 5.6). The gun changes everything for him, as he gains confidence and becomes one of the best in his class, rewarded by the commander at the graduation.⁶ This transformation happens through a series of performative actions, covered in the next section.

The first perspective, the stage prop, examines the prop for its materiality as a prop contributing to the training of the actor. Using a real gun on stage introduces a distinct materiality, experienced through touch and motion. The Stanley Kubrick archive possesses daggers (SK16/3/2/7) and hand grenades (SK16/3/2/6), which I have examined. I am no expert, but they all had weight and felt real. The grenades, however, are replicas which are thrown at previously installed explosives planned to trigger safely. The rifle is not in the archive but was rented from a company called Hill's Small Arms Ltd in England (SK/16/2/3/20) and, to my surprise, was a real gun. According to Matt Vogel (2019), ‘in most

⁶ This reward is presented in the novel but omitted in the film.

cases the guns are real BUT they have been (or should have been) theatrically modified'. It is simply easier to get a real gun than a replica. They shoot blank bullets made for that specific gun, so the actor feels and shows the recoil.⁷ What is less discussed, is the impact on the actor, since the mobility of guns adds to their materiality, bringing the actor closer to the action. This motion, however, comes with danger, as we have recently been reminded through the news, even a replica gun is not necessarily safe and has the ability to hurt or kill if not properly handled.⁸ The boundary between the stage (the actors, props and crew) and performance (the action) is fragile, and so is the boundary between fiction and reality when the consequences are considered.

Figure 5.6

Pyle training as a marksman (Scene 39)



Note. [Film Still]. Kubrick, S. (Director). (1987). *Full Metal Jacket* [Film]. Stanley Kubrick Production and Warner Bros.

The second perspective examines the cinematic rifle, an object that exists on the screen. The difference between a prop and a cinematic gun means that some of the details of the performance of the object have to be recreated. The post-production crew has to fill the imaginary gap between the script and the action. On screen, it has to be handled properly by the actor to have the right effect (recoil and muzzle flash), avoiding the proper

⁷ In *Obvion* (2013) making-of, Tom Cruise is appreciative of the crew building a realistic helicopter to help him previsualise the movement of the machine (Mansi, 2013). Cruise is an actor but also a pilot who took part in the making of this fictional helicopter as an expert.

⁸ The most recent example is the killing of Halyna Hutchins by Alec Baldwin (2021), but there have been other cases such as Brandon Lee (1994) and Jon-Erik Hexum (1984) who were killed by prop guns while working on Hollywood productions. D'Onofrio joined the controversy on social media by advising that all weapons should be handled in post-production (D'Onofrio, 2019).

consequences of someone getting hurt or worse. The addition of sound and editing is essential in strengthening the realism of the action, but it creates a duality for the actor, who enacts a situation that becomes something different in the edited version. For example, in the final scene of the first part, Pyle kills Hartman then himself. The scene was particularly difficult to recreate. In his diary, Matthew Modine mentions that Kubrick was looking for a killing shot in the head (Figure 5.8). Modine shared the film of a close range killing from *Live and Die in L.A.* (1985) with Kubrick (Modine, 2014: 187'30"387). Kubrick decided to follow a similar path and Modine describes the setup (Modine, 2014: 189'44"749).⁹ The reality of the stage is indeed far removed from the film, as the actor was not injured, since the bullet was made of pasta (Figure 5.8). However, in the same scene, Pyle also shoots his sergeant. They created it through a small explosion to produce the blood splatter which had a lasting effect on actor R. Lee Ermey (Figure 5.7), impacting him for several days (Modine, 2005). Cinematic effects help render the consequences of war visible, yet they often emerge from a reality very different from the one they depict.

Figure 5.7 and Figure 5.8

Two actors, two ways of being killed on stage.



[Photographs of R. Lee Ermey (Left) and Vincent D'Onofrio (Right)]. (1986). The Stanley Kubrick Archive (SK/16/3/29 -Divider 25A 2.6 Inscription T.I. and SK/16/3/29 & Divider 25A 2.6 Inscription 967/8). Courtesy of the Archives and Special Collections Centre, University of the Arts London, United Kingdom.

⁹ They used pasta and fake blood in a PVC tube and high-pressure air to send the 'brain' at tremendous speed while the actor pulled the trigger. A few frames were removed so the audience would not see the full trajectory of the brain.

Unpacking objects from their use and from the consequences of that use is a key aspect of this thesis. The rifle already possesses a relational element, but it must be expanded to encompass the social dimension. The idea of a relationship with an object can be traced back to James J. Gibson's theory of affordances (1979). Before Gibson, the prevailing view was that 'humans are only able to understand the function or the meaning of an object indirectly, through internal representations' (Knappett, 2004, p.44). Gibson introduced a relational perspective, arguing that understanding an object is not solely about categorising it but about recognising its possibilities for action. This shift emphasises the necessity of achieving 'transparency of the object to the user' (Knappett, 2004, p.47), but transparency can be limited. For instance, certain chairs may only afford sitting for adults, while children or the elderly might struggle to use them. This social element can be reinforced by using fiction which expands this affordance beyond the present, exploring not only how objects function now but also how they might shape future actions and consequences.

The relational scope of the rifle is important but requires further analysis that should include its social role. The scripting process reveals multiple uses that extend beyond the conventional understanding of an object's affordance.¹⁰ John Bateson (2015) finds that only 15-20% of soldiers fire their weapons, and an even smaller percentage fire to kill. A rifle can and does have a good affordance, but the soldier is the one deciding what to do with it, whether to aim and pull the trigger. The rifle's function is to shoot bullets, but this is only properly enacted when the soldier decides to aim at the enemy while he shoots. This is exemplified, but not explained, in the film, in a scene where the soldiers are shooting at a building (Figures 5.9 and 5.10). Akrich proposes examining the object in terms of three key concepts: inscription (the work of the designer), prescription (how the object is intended to function), and description (the user's choices in engaging with it). In the case presented by Bateson (2015), the soldiers are likely able to prescribe the object but decide to describe it differently.

The rifle, as a prop, can be examined in three ways, as stage material, a cinematic rifle and a social object. The stage material helps the actor with his performance through weight and recoil. It grants the actor a sense of the object in action. The cinematic rifle is one for the screen, with added special effects, sound and editing to make the consequences

¹⁰ I discuss this further in section 5.1.4.

more believable for the audience. The third approach to the prop focuses on training. While the training prepares the soldier to aim and fire, it does not prepare the soldier to pull the trigger when facing another human rather than a target. There is a similarity to design, where affordance helps create a relation with an object by allowing the user to understand its use. However, it is the scripting of the object that is important here, deciding to use the object (description) for what it has been built for (inscription and prescription).¹¹ Regarding intelligent technologies, it raises the issue that they act locally but provide little understanding of their impact at a larger scale. Their tendency is to work like cinematographic rifles rather than stage material.

Figure 5.9 and Figure 5.10

A building, before and after shooting (Scene 69)



Note. [Film Still]. Kubrick, S. (Director). (1987). *Full Metal Jacket* [Film]. Stanley Kubrick Production and Warner Bros.

5.1.3 The Rifle in Action: A Performative Relationship

‘Every aspect of the killing on the battlefield I rehearsed, visualised, and conditioned’ – Lt Colonel Dave Grossman (Grossman, 1995, p.254).

‘Joker isn't born to kill; he is trained to kill’ – Joker (Kubrick & Herr, 1987).

The performative relationship involves identifying a new mode of engagement with the rifle that transcends instrumentalisation. As seen previously, power and care both tend to maintain the instrumentalisation of technology, while a third force operates as an agent of reflection, questioning assumptions and opening space for alternative configurations. The

¹¹ This is particularly important for the social role of design in sustainability, for example (see section 5.3.1).

training relies on an object, the rifle, that should enable the soldier to adopt a better perspective of the object. In the first part, I examine the training of soldiers and actors as a performance, for its ability to socialise them using a specific language, 'Gruntspeak'. In the second part, I identify the Marine Rifleman's Creed (the Creed) for its potential as a performative relationship (RQ1). It is a recitation with the ambition to reconfigure the soldier's relationship with the rifle by transforming the training into a process of a relation of becoming with the rifle.

Army training prepares soldiers not only to be physically fit but also to assume a social role. This is similar to the experience of actors, for whom performance is not merely a matter of representation but a process of becoming the character. In the opening quote above, Grossman (1995) states that war needs to be 'rehearsed, visualised, and conditioned' (p.254). These words could easily have come from Kubrick, as military training and the representation of military training have some similarities. To make sure the actors played the roles of soldiers well, Kubrick hired a technical advisor, R. Lee Ermey. He was an experienced drill instructor in the military and eventually took on the role of Gunnery Sergeant Hartman in the film.¹² Before filming began, he was initially responsible for training the actors to become soldiers. Ermey recalls having trouble bringing the actors to train, they would say 'we'll let the background extras do that, we don't need to, I could just pick it up' (Ermey, 2001) but he disagreed, telling them 'close order drill and a rifle manual you cannot pick up on the set when it's time to do it.' (Ermey, 2001). Ermey simultaneously undertook the training of the actors and portrayed the character responsible for training the soldiers.

In Marine training, language plays a crucial role as a tool for socialisation, shaping the group's identity. While it facilitates the socialisation of soldiers, it is also problematic due to its embedded manipulation. The process operates through enforced submission, making language function less as neutral instruction and more as a persuasive mechanism that conditions recruits into compliance. According to Ray Bourgeois Zimmerman (1999), Hasford's novel portrays a 'strategy deliberately employed by the Marine Corps in its basic training to programme its recruits into a certain kind of submission' (p.66). In the novel (Hasford, 1979), Private Pyle is called a 'shitbird' (p.23) or 'grunt' (p.23), before finally

¹² R. Lee Ermey spent time improvising for Kubrick, with his performances transcribed and edited for inclusion in the script, drawing on his real-life experience as a drill sergeant (Mathis, 2001).

demonstrating, through his suicide, that he is a 'ten percenter who did not pack the gear' (p.37). The use of rude language is not merely decorative, it conditions soldiers to develop resilience. Zimmerman identifies the specific language of army training, Gruntspeak, which he refers to as 'a specialized discourse the Marine Corps employs as a mechanism of socialization and thought control' (p.66). However, the Gruntspeak only functions by 'persuading, simplifying, and transforming' (Zimmerman, 1999, p.66). This form of socialisation through language merely represents another means of instrumentalisation.

During training, the rifle remains largely in the background until the soldiers begin target shooting. The Creed changes this relation by helping the soldiers consider the importance of the rifle.¹³ It is practiced as a recitation, and can be thought of as one, if it is defined as a way of creating a set of shared beliefs among the recruits. The original Creed and the versions presented in the novel and film differ slightly, reflecting distinct perspectives that I analyse in the following paragraphs. Here is the version of the Creed in the film (Figure 5.II):

This is my rifle. There are many others like it, but this one is mine. My rifle is my best friend. It is my life. I must master it as I must master my life. Without me, my rifle is useless. Without my rifle, I am useless. I must fire my rifle true. I must shoot straighter than my enemy, who is trying to kill me. I must shoot him before he shoots me. I will. Before God I swear this creed. My rifle and myself are defenders of my country. We are the masters of our enemy. We are the saviours of my life. So be it... until there is no enemy... but peace. Amen (Kubrick & Herr, 1987, p.13 and p.18).

The Creed begins by establishing an asymmetric relation with the rifle which is presented as an instrument: 'without me, my rifle is useless'. However, it gradually moves beyond instrumentality by attributing a stronger form of agency to the rifle, especially when it declares that 'my rifle and myself are defenders of my country'. The repeated use of 'we' reinforces this transformation: soldier and rifle become 'masters of our enemy' and 'saviours of my life'. In this sense, the Creed does not simply describe the rifle as a tool, it normalises a relation with the object. This distinction becomes clearer when compared

¹³ Historically, the Creed is credited to Major General William H. Rupertus (1889-1945) and published in 1942. It continues to be taught to US Marine recruits during their training.

with a scene from the novel that does not appear in the film, where Joker tells Pyle to ‘think of your rifle as a tool’ (p. 9). The Creed does something more complex as it grants a form of symmetry with the soldier. The rifle exceeds mere usefulness by becoming patriotic, as both soldier and object are described as ‘defenders of my country’. This provides a useful example of Heidegger’s distinction between the present-at-hand and the ready-to-hand (1927). In the first instance, the rifle appears as a material object, with weight, fragility, and physical presence. In the second, it withdraws from use and becomes incorporated into the soldier’s bodily competence. As Pyle learns to shoot accurately, he gradually forgets the weight of the rifle, it becomes ready-to-hand. The Creed takes this relation further: the rifle is not only absorbed into the body of the soldier but also into the symbolic body of the nation. It becomes an extension of patriotic agency itself.

Figure 5.11

Pyle and other soldiers recite The Rifleman Creed.



Note. [Film Still] Kubrick, S. (Director). (1987). *Full Metal Jacket* [Film]. Stanley Kubrick Production and Warner Bros.

Both the film and novel omit one paragraph from the original creed, a reference to the tendency of soldiers to avoid their target: ‘We know that it is the hits that count. We will hit’ (Marine Corps University, 2021). It might not affect the soldiers as such, but the repetition of the word ‘hit’ as a common performance, becomes persuasive. This aspect is central to the development of the Creed, which I will draw upon in the following discussion.

My rifle and myself know that what counts in this war is not the rounds we fire, the noise of our burst, nor the smoke we make. We know that it is the hits that count. We will hit. (Marine Corps University, 2021).

The novel, however, retains a paragraph from the Creed that is absent from the film. This point is crucial, as it extends the agency of the rifle by asserting symmetry between the object and its owner, as an active participant in the soldier's identity and action.

My rifle is human, even as I, because it is my life. Thus, I will learn it as a brother. I will learn its weaknesses, its strength, its parts, its accessories, its sights and its barrel. I will ever guard it against the ravages of weather and damage as I will ever guard my legs, my arms, my eyes and my heart against damage. I will keep my rifle clean and ready. We will become part of each other. We will. (Marine Corps University, 2021).

The first sentence: 'My rifle is human, even as I, because it is my life' places the subject and the object on the same plane. Military author Mick Howard (2013) sees this as a mere anthropomorphic, rhetorical exercise. This is an important criticism of the approach taken by this thesis. Giving human characteristics to an object is similar to the idea of animating a character in a child's play (Allison, 2006). Indeed, it is easier to understand it this way, as we are used to see everything as if emanates from the human mind. In contrast, the posthuman perspective views agency differently, attributing it to materials themselves. Jane Bennett (2009), for example, describes how a material such as garbage is able to create a hole in a pipe and contaminate water with acid, illustrating the material's capacity to act. Similarly, ANT grants agency to objects, but in terms of influence rather than direct action, framing them as 'an occasion for other things to start acting' (Latour, 2005a, p.60). This perspective aligns the Creed as a source as reconfiguration of the relationship with the rifle.

The Creed contrasts with the relationship of care presented at the beginning. The ritual in which the drill master asks the soldier to give a name to their rifle is more than a

care by maintenance.¹⁴ Pyle names his gun Charlene, a female name to instigate an intimate relationship.¹⁵ At first, it may appear purely symbolic, but it translates into other action, such as in scene 36 where Pyle starts talking to his gun as one of the consequences of the beating from the other recruits: 'It's been swabbed... and wiped. [...] So that your action is beautiful. Smooth, Charlene' (Kubrick & Herr, 1987, p.40). Maintaining their guns is an important task for the soldiers, but Pyle starts to address his rifle directly, and eventually by name. Naming or addressing the rifle may seem excessive, but so too is neglecting its maintenance, even if this is not immediately apparent.

The performative relationship (RQ1) presented through the Creed, a recitation that helps the soldier accept the agency of the rifle, is, from a military perspective, an attempt to script the object as an essential war companion. However, the prayer also turns the rifle into a companion by making the relationship symmetrical. The book puts an emphasis on the last two paragraphs, describing Pyle's voice: 'his voice booms louder and louder' to shout, "MY RIFLE IS HUMAN [...] WE WILL BECOME PART OF EACH OTHER" (Hasford, 1979). This recognises the agency of the rifle in relation to the soldier. The performative relationship between Pyle and the rifle exemplifies the use of the Creed as an alternative to persuasiveness and other psychological manipulation by emphasising the relation with the object, particularly when the object articulates an issue, such as killing. Drawing on the verb from Creed that emphasises Pyle's transformation, I refer to this dynamic as a relation of becoming, which serves as a guiding thread throughout the chapter.

5.1.4 Discussion: From the Trigger to the Aim.

This discussion examines training as a solution, where the issue is addressed either through psychological means, rendering both the user and the object passive, or through social means, where the agency of object is considered. I first discuss the results gathered thus far then investigate the origins of the Creed. I argue that interpreting the Creed as a

¹⁴ In the book, the naming of the rifle follows the Creed but, in the film, they are requested to find a name (scene 7) just before they recite the Creed (later in scene 7). However, we only learn the name chosen by Pyle in scene 36 and it is shared with the drill sergeant in scene 40.

¹⁵ Charlene is also the name of Hasford's ex-wife, Charlene Broock. That intimacy is mirrored on the stage as the rifle as a prop is named after Pyle's civilian name, Leonard (Modine, 2005).

response to a specific issue, even within a military context, provides valuable insight into the potential reconfiguration of technology. I analyse the evolution of rifle training, tracing the issues that led to its improvement in preparation for the Vietnam War. The focus is on the military's growing emphasis on training soldiers not only to shoot but also to aim properly, thereby maximising combat effectiveness. While this claim of effectiveness is crucial within a military context, its application to society has both positive and negative repercussions.

The formation of Private Pyle and his rifle presents a new narrative for reconfiguring intelligent technologies, advocating relationships that move beyond power or care, where the end goal supersedes the means. The concept of a third force demonstrates the potential for an alternative approach. Unfortunately, it can be applied negatively, as in the case of Pyle in *The Quiet American*, as much as positively, as in the case of Pyle in *FMJ*. However, the advantage is that it requires soldiers to break from their instrumental positions, to think about their social roles. The Marine Creed shows another perspective, in which the change does not come from the human but from the relation between the human and the object, as a relay. As a prayer, it gives the soldier time to consider the importance of their weapon and, as practice, breaks the barrier between the human and the material by recognising the agency of the object. The materialisation of the rifle is also revealing, as it demonstrates the importance of incorporating the consequences of use into the material development of objects. The formation culminates in a performative relationship, serving as the key element that enables a reconfiguration of our relationship with technology by fostering an agreement between the user and intelligent technology.

While training takes a normative approach to improving a soldier's fitness, when confronted with more complex issues, the emphasis shifts to the strategic manipulation of the soldier. In a report following the Second World War, General Marshall (1947/2000) stated that only '10% of soldiers were actually shooting to kill' (p.53), they were trained to pull the trigger and aim at a target yet often chose not to direct their aim at the enemy when firing. The purpose of military training changed at the beginning of the Vietnam War. Grossman (1995), an army psychologist, noted the existence of a 'safety catch' among soldiers, demonstrating that a majority wouldn't kill. Training techniques were revised so that the conditioning of soldiers would enable killing (Grossman, 1995). The methods used to achieve an increase in killing were desensitisation, conditioning and denial defence

mechanisms (p.251). In this solution, the focus is on the soldier only and the rifle is delegated to a passive object.

I critically examine the techniques used to enhance soldiers' efficiency in the field, distinguishing those that lead to mechanisation from those that result in genuine improvements that can be applied to social relations. Desensitisation involves reducing a person's emotional response, however, its broader consequences are not sufficiently considered. Dyer (1985) interviewed a sergeant on the topic of desensitisation:

We'd run PT in the morning and every time your left foot hit the deck you'd have to chant "kill, kill, kill, kill". It was drilled into your mind so much that it seemed like when it actually came down to it, it didn't bother you, you know?
— USMC Sergeant (Vietnam veteran).

Desensitisation is depicted in *FMJ*, particularly through the repetitive use of the word 'kill' during training, to the point where it loses its meaning. This is exemplified in Scene 33, where recruits chant 'kill, kill, kill!' (Kubrick & Herr, p.38). While I acknowledge that desensitisation is significant in the context of war, it is also crucial to consider its effects beyond combat. Soldiers occupy a social role within the military structure itself, and Pyle exemplifies this when he turns the logic of his training against the system by killing his sergeant.

Conditioning represents a clear form of manipulation through repetition, whereas the situatedness of training, such as being in the appropriate geographical context, is only a means to enhance understanding of the world. While the expected outcome of both techniques is similar, the latter involves training with a limited degree of manipulation, emphasising understanding over automatic response. According to (Grossman, 1995), conditioning is known as the 'quick shoot' (p.253) focusing on psychological training that emphasise repetition to build automatic response. While it increases the mechanisation of the soldier, Grossman (1995) also suggests that marksmanship training should take place in a realistic environment, such as sitting in a foxhole with full combat equipment in a lightly wooded, rolling field (p.253). The more realistic the situation, the more effective the training such as using human-shaped targets to train soldiers to aim and fire quickly, which can be reinforced by the visual satisfaction of seeing the target drop backward (p.253). Conditioning mechanises the human, but the military training also considers the training through the context to help the soldiers fully grasp the issue they may face.

Denial and defence further exemplify the mechanisation of humans, with soldiers trained to detach emotionally from their actions, even when those actions are inherently inhuman. This the strongest level of mechanisation of humans. This third barrier is identified by army psychologists approaching humans as machines, where coping with traumatic experiences is a matter of erasing them (Grossman, 1995, p.55). These are unconscious methods that work through repeated rehearsal. The soldier internalises the process to such an extent that, in combat, they can deny at some level that they are actually taking another human life. In *FMJ*, bayonet training is portrayed as an effective method for cultivating the 'killer instinct', as highlighted in Scene 27. Conditioning through denial and defence is appropriated by the military as a method of eliminating the inner human entirely.

These psychological approaches to the issue of trigger and aim are logical solutions in a military context but must be reconsidered in light of their broader social implications of technology. The Creed is still present in this new training programme, but a different approach is taken, positioning the soldier and the rifle on an equal footing. The training shifts focus from transforming the soldier to redefining the relationship between the soldier and the rifle. Examining the Creed, it is easy to qualify the relationship in terms of anthropomorphising the rifle, making it human. While this is a plausible perspective, the Creed is a concrete materialisation that attunes the soldier to a performative relationship. It not only animates the tool (an anthropomorphic perspective) but contributes to a stronger relation between the user and the object.

In the context of the film, the rifle is seen in use, but we are shown how it comes to be of use (the training), as well as the impact on the user (Pyle) and his fellow recruits. The skill of shooting (the trigger) differs from the capability to take a life (the aim). From a psychological perspective, this process requires the deliberate disengagement of the 'safety catch', along with conditioning and the denial the defence mechanism (Grossman, 1995). While these approaches may be highly effective, they must be considered in relation to the soldier's reintegration into civilian life after returning from the army, in terms of the damage they might cause to social relations. Alternatively, I propose considering these approaches as frameworks for rethinking our responses to collective challenges. For example, the concept of the safety catch offers a way to reflect on issues within our mental models, particularly in a context where the instrumentalisation of technology has become habitual.

5.2 Speculative Affiliation: The Morality of the Rifle

The affiliation of the prop deepens the analysis by comparing it with other enacted technologies that address similar issues. As a key component of the translation method, it situates the performativity of the object within a broader social context and enables a critical examination of how these technologies reconfigure the conditions of killing. In the first part, I compare technologies, such as a gun with ‘selective killing’ in *Westworld* (2016–2022), ‘stun mode’ in *Star Trek* (1966–2020), and the light sabre as a ‘noble gesture’ in *Star Wars* (1977–2019). In the second part, I delve into the relational issue between the user and the object by examining the rifle in terms of morality. I argue that morality is not only situated in the interaction with the object but also in the training. Drawing on Kubrick’s statements and the actor’s portrayal of Pyle as a ‘monster’ (see section 5.1.1), I demonstrate that the rifle’s mediation is secondary and that the true technological monster is the training itself. I refer to this as second-degree mediation, where the key issue is not the relation with the technology but the relationships it establishes. This training, as a form of mediation, ultimately shapes both the soldier’s relationship with technology and their efficiency, which in turn influences their interactions with others.

5.2.1 Reconfiguring the Rifle through Science Fiction

By examining three examples from science fiction, I demonstrate a plurality of possible futures for weapons. These performative technologies illustrate situations in which the weapon incorporates embedded limitations, as in *Westworld* (Joy & Nolan, 2016–2022), or offers optional constraints, as in *Star Trek* (Roddenberry, 1966–2020). Finally, *Star Wars* (Lucas, 1977) emphasises training as the primary means through which the use of weapons is mediated. When critically examined, it becomes evident that most of these solutions are temporary, imposing limitations on the technology itself rather than addressing the training practices that surround its use.

The first example comes from the TV series *Westworld* (Joy & Nolan, 2016–2022) where the gun is used in western reconstitutions populated by robots. The human spectators decide to take part in the events, such as joining a story where they kill dispensable robots at leisure. In contrast, robots also have guns, but they are unable to hurt humans. In *Westworld*, guns do not kill but instead become an illusion, reinforcing the notion that killing a humanoid robot is acceptable, while taking a human life remains problematic. However, this does not resolve any concerns about weapons. Rather, it

contributes to what Grossman (1995) describes as a programme of desensitisation and the mechanisation of humans. In a twist, the robots accumulate residual memories of those traumatic moments and eventually decide to revolt against the humans. It is not the guns that kill in this case, as the robots are easily put back together, but the gesture of killing and the memory of the victim.

The second example is the TV series *Star Trek* (Roddenberry, 1966-2020) which introduces the 'stun mode' function of its weapons. This fictional technology is a gun with a series of choices such as killing or stopping. It allows humans to choose between self-defence and attack while offering the opponent an opportunity to concede defeat and avoid the ultimate fate. As many of the inventions from *Star Trek*, this solution exists already, in the form of the taser. In a critical article, Frederic Moreau De Belaing does not draw a comparison with science fiction but reminds us of the inherent dangers associated with the tool (2015). Following a controversy about the taser's use, the French Government required it to be supervised and controlled. It was the training that was put in question. The training was to be accompanied by a periodic process of assessment (Moreau De Belaing, 2015), highlighting the importance of training with new technologies. While they may appear to be less harmful, they can be used in a harmful way, and it is not merely as a matter of usability, but a process that must be accompanied by an understanding of the consequences.

The third example comes from *Star Wars* (1977), a film that reimagines the Vietnam War in a galaxy far away. The context in which the film was developed is particularly important, as it draws upon the Vietnam War. According to Daniel Immerwahr, George Lucas intended to direct *Apocalypse Now* (1979), before deciding that *Star Wars* (1977) would be a better way to approach the subject (2022). The mechanised bullies (the Americans) losing to guerrillas (the Vietnamese) was a common theme in the war, which Lucas adapted into a story set in another galaxy to show that technology is the basis of world power (Immerwahr, 2022). I posit that the lightsabre is the innovation that replaces the gun. However, rather than being a purely material weapon, it is embedded in a mythological society, the Jedi, whose power is not based solely on strength but on their ability to harness the 'Force', with which they sense and navigate their relationship with nature. Training is the key to mastering the Force and the lightsabre, which are intrinsically linked. This mastery requires not only skill but also qualities such as dexterity and resilience.

These three alternatives to the rifle, the selective killing of *Westworld*, the stun mode of *Star Trek* and the Force of *Star Wars*, are cinema's attempts to reconfigure killing. *Westworld*'s selective death function seems to advance the cause, but the gun does not lose any of its embedded violence, and the intention to kill does not disappear among the robots. Their killings by humans stay in their memories and they eventually revolt against their positions as slaves. *Star Trek* gives resolution through a gesture with variable consequences, giving the carrier of the gun the choice of using a lethal approach or the stun mode. A version of this exists in reality, but despite the training given to policemen abuse happens and people get hurt. Finally, *Star Wars* proposes an alternative that does not alter the outcome but focuses on the gesture. Using a lightsabre requires extensive training and reduces the speed of fighting with the goal of accessing an invisible force shared with nature. While these solutions belong to fiction and offer a degree of optimism, the first two only represent minor improvements in the use of technology to resolve conflicts. One key takeaway, however, is that slow tools are preferable to fast tools. The immediacy of technology—even selective or less lethal options—always carries inherent risk. Training should be considered with regard to long-term consequences, as training to harmonise with nature is more beneficial than training for efficiency.

5.2.2 Discussion: The Moral Relationship

When analysing a deadly weapon, the moral dimension may seem obvious, but the challenge lies in determining whether morality should be attributed to the user or the object itself. I begin by synthesising key perspectives from the philosophy of technology, concluding with Latour's argument that morality is neither inherent to the object nor the user, but rather emerges through mediation. Building on this perspective, I introduce the concept of second-degree mediation, showing that the issue extends beyond the user and the object itself but is also embedded in the training process.

The first approach to the morality of the object is to consider it neutral: a gun cannot kill on its own, and responsibility is therefore placed on the user. The neutrality of the gun has long been a subject of debate in the United States; the claim "Guns don't kill, people kill" has been promoted by the National Rifle Association (NRA) since the 1970s. In the philosophy of technology, this position is referred to as the value neutrality thesis, which holds that technological artefacts do not contain embedded values (Pitt, 2014). This is a theory of common sense that suggests that those who design and build things are not responsible for how they are used. While it is evident that an object cannot act on its own,

the affordance and the script demonstrate the clarity of use for the user. In the case of the rifle, its affordance facilitates the ease of pulling the trigger, while its script defines its intended function for the user. The soldier still has the choice to aim in the right direction, as shown, but the trigger itself imposes no moral restriction.

Mediation theory approaches the issue differently, as it attempts to find an exit from the debate between the morality of the user and the materiality of the object. This started with Latour (1994), and had contributions from Verbeek (2010). I focus on the original argument by Latour, according to whom, the reasoning of the NRA presents a contradictory message. The gun can be seen from a materialist perspective, which is that if a good person becomes angry and carries a gun, he might become a criminal, as if 'the good citizen is transformed by the carrying of a gun' (Latour 1994, p.31). Taking a moralist stance, according to the NRA one is born a good citizen or a criminal, it is the essence of the carrier. The materialist approach is a reversal of the moralist approach. In both accounts, it is about what you are not what you have, 'the techniques are nothing more than pliable and diligent slaves' (Latour, 1994, p.31).

Private Pyle does not reflect the case of the civilian gunman presented by Latour, but this allows me to contribute to his perspective by introducing the training as a second-degree mediation. The role of soldiers is better defined than civilians as the training teaches them to follow orders. However, it would be a mistake to see the soldier as an essence or pure instrument. As discussed, the decision to kill is not automatic and the training which soldiers received during the Vietnam War was an attempt to correct this. Indeed, the training seems to have increased efficiency but at the cost desensitising the soldiers to the humanity of others. In the process, the training desensitised the soldiers from their own humanity. In the military, the relation with the gun is neither moralist, nor materialist, as in the example given by Latour, but a relation changed through training.

The mediation between the soldier and his rifle, the training, accelerates the change but may have deeper impact on the user. The programme of action of military training has a similar structure if the military goal is interrupted (the soldier is not strong enough), and the trainer enlists the training as a tool to desensitise the soldier. When soldiers are being trained through desensitisation, removing the 'safety catch', it is the entirety of their humanity that is removed. The killing of the sergeant should not have happened, but it is

unsurprising considering the accessibility of the weapon and training.¹⁶ In a similar way, the instrumentalisation of technology pushes us towards the delegation of our agency to technology and, while it is not about killing, the desensitisation might lead to other unexpected behaviours at a local or a global level. For instance, sending notifications to users to ensure engagement with software can have societal repercussions, because we get used to being interrupted. This illustrates the broader impact of technology-induced behaviour on society. The training is not only used to impart skill, it changes the people who receive it, and the notion applied to training is whatever is directed by the trainer.

This second degree of mediation through training allows me to reconsider the idea of Pyle as a monster, as identified by the actor, and extend this idea to existing theories such as persuasiveness. The story of Frankenstein is often presented as a cautionary tale against technology but, according to Latour, people often forget that Frankenstein is not the name of the creature but the creator (2011). He suggests that we need to change our perspective from the failure of the creation to the failure to care for our technological creations, suggesting that ‘unexpected consequences are *attached* to their initiators’ (2011). The persuasiveness of technology serves as an example. In *Re-engineering Humanity*, Frischmann & Selinger (2019, p.9) see this kind of nudging as an ‘incredible variety of small-scale decisions we each make about technology that seem, on their own terms, rational and unproblematic’.

My interpretation of Pyle is that he is an innocent man until he joins the army. There might have been good reasons for him not to join at all, or be dismissed, since the task would be overwhelming for him. A principle of precaution should have applied to Pyle and, indeed, there are structures in place in the military for cases like Pyle, such as the one described in the documentary *This Is Parris Island* (1970). Despite his physical condition, Pyle manages to get noticed as a good marksman, finding something in his rifle that he does not have with his fellow recruits. In the end, I do not consider Pyle to be the monster portrayed by the actor. While the hybrid rifle-Pyle (gun-man) is a step towards a monster, as suggested by recent theories of the morality of objects, we should look further. Latour suggests that we should not confuse the creator with the creature, the army’s training for Pyle. When training seeks desensitisation, we should prepare for more killing within the

¹⁶ The psychology of Pyle undoubtedly plays a role, as depicted in the movie, but I am moving away from this perspective.

ranks and suicides among soldiers. The failure of the so-called monster can be attributed to a failure of care, particularly the lack of anticipation regarding the use of desensitising training.

The morality of a gun or rifle is easy to discern, as its consequences are well-known and predictable. Common sense often frames this issue in terms of either the user's morality or the materiality of the gun. However, Latour argues that the issue should be understood as relational, a combination of both factors. I support this perspective, but also consider the affordance and script embedded in the object. Through studying Pyle's case, I argue that the issue extends beyond the morality of the rifle itself. I extend the concept of mediation by identifying training as the key factor that desensitises soldiers, enhancing their ability to kill their opponents while simultaneously diminishing their sensitivity to their own humanity. This leads me to conclude that the real monster is not Pyle, as suggested by the actor, but the training, which fails to account for its moral consequences.

5.3 Technological Relatedness through Training

The final stage of the translation consists of composing the research findings into a new proposal for intelligent technologies. Using performativity as an analytical lens, the formation stage reveals issues inherent in the making of technology. In this case, it reveals the predominance of classical relational frameworks, such as power and care, which mobilise training as an entanglement of modernity. This often results in persuasive technologies (Fogg, 2018), which approach training through tactics such as pushing, manipulating, nudging, and even bullying to influence behaviour (see Frischmann & Selinger, 2019; Zuboff, 2020). The goal of translation is therefore to be aware of these tactics and reconfigure them. To this end, I draw on the performative relationship between Pyle and his rifle (RQ1), revealed through the Creed as a third force, as well as comparative analyses of other props in cinema (RQ2), to articulate the foundations of technological relatedness (RQ3) as a means of engaging with these tensions by problematising control in interaction design.

In the first part of this section, I demonstrate that technological relatedness is a mode of engagement with the collective through intelligent technology, grounded in an ongoing process that seeks symmetry with technology across a network of relations. I focus on the issue of training where interaction is perceived through its role of mediation. The initial process is revealed through performativity and shows the repetition of relations of

power and care as a stabilised relational pattern. To go beyond this, I reorient the analysis towards the collective, drawing on Simondon's theory of transindividuality (1958/2017) using technology as a form of mediation. To foster symmetry, I propose embracing friction as a method that modulates the agency of intelligent technologies when they are understood as part of a network of relations, as exemplified by the Creed. The second part of the section discusses the broader implications of technological relatedness in interaction design by reframing sustainability.

5.3.1 Training as Process of Transindividuality

Training of the user is often emphasised in sustainability discourse because the issue is frequently framed at the level of individual behaviour. Interaction design deals with such a situation by focusing on the visible problem, the individual, and thus confusing the monster with the origin of the problem (see Section 5.2.2). For example, designers often face the temptation to impose restrictions on human behaviour and advocate behavioural methods of influencing decision-making, using techniques such as persuasion to address these issues (see Laschke et al., 2023; Nieder, 2020). While persuasive technologies may support the collective and operate through asymmetrical relations, they often do so while rendering the process and the underlying network invisible. Instead, I conceptualise relatedness as an engagement with the collective that fosters symmetry with technology while rendering networks of relations visible. Training, therefore, becomes a central site for examining these relationships.

While the relationship with the collective is positive in persuasive technologies, attempts to impose it through nudging and manipulation undermine trust and limit meaningful engagement. Relatedness proposes an alternative approach, structured through three key elements that sustain trust and enable engagement with the collective. Firstly, the process refers to the dynamic through which the relationship between the object and the user is constituted. Through the study of performativity in FMJ, relational frameworks, such as power and care, are problematised, while performative relationships reveal new possibilities, such as those articulated in the Creed. Secondly, such a relationship demonstrates the possibility of rethinking intelligent technology in more symmetrical terms. While not fully symmetrical, the symbolism of Marine training suggests that the rifle is more than a simple tool; it is essential to the soldier's survival, as demonstrated, for example, through its maintenance. Thirdly, the question of the network emerges. In the film, the killing and Pyle's subsequent suicide disrupt the illusion of

training as a force that solely improves soldiers. Instead, they reveal that training can act as a third force, compelling trainees to reconsider their position within the system.

Table 5.1

The character and the object of FMJ examined through process, symmetry and network

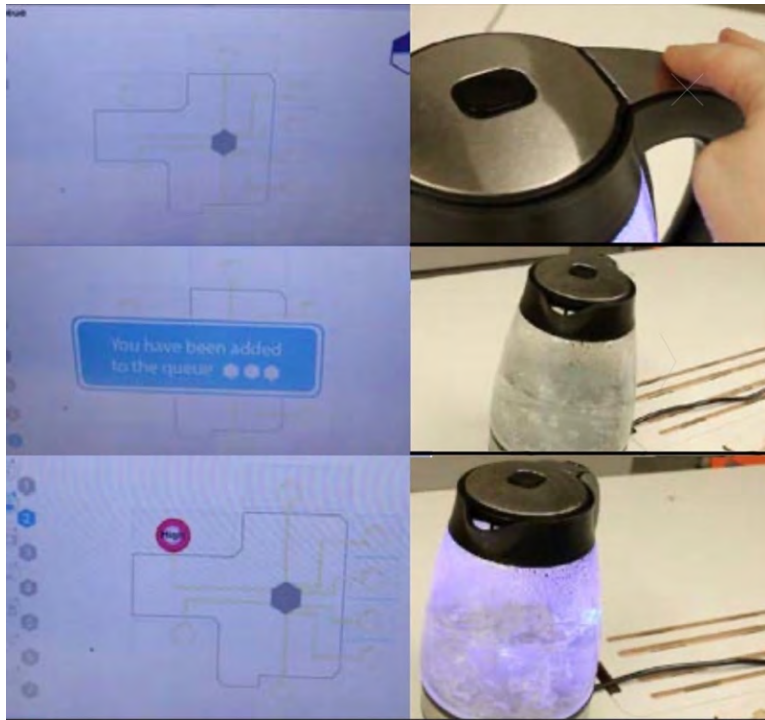
Process (in the film)	Symmetry (in the film)	Network (in the film)
Performativity through power and care	The Marine Creed	Pyle's suicide and killing act as a third force that compels the trainees

When addressing intelligent technologies, the translation from the prop requires particular consideration. The analysis through performativity initially serves to identify issues embedded within networks of relations, such as power or care, articulated through the film. However, developing a solution requires an approach oriented towards the formation of relationships between users through technology. In this regard, Simondon's theory of transindividuality provides a framework for understanding how users may be trained through technology as part of a broader relational process. To demonstrate this transformation, I focus on sustainability in interaction design, a particularly contested domain often framed as a problem of individual behaviour rather than of systemic conditions (Shove, 2010). As Bazzano(2025) observes, individuals are frequently treated as 'groups of one', reinforcing an individualised logic of responsibility. The pursuit of convenience further intensifies this tendency. By contrast, I argue that, when situated in relation to infrastructure, individuals should be understood as part of a collective.

To exemplify the concept of relatedness through training, I draw on a project by a South African interaction designer who understands electricity as a rationed commodity (Smidt, 2016). In this project, the boiling of water in England at teatime is examined as a systemic issue, revealing that the UK National Grid must sometimes draw electricity from France to meet peak demand from kettles (Schaps, 2014). In response, the designer proposes a smart kettle (Figure 5.12) that is aware of grid demand and communicates with other kettles in the neighbourhood to coordinate usage. Kettles would effectively form a queue, with electricity supplied sequentially rather than simultaneously. This delay reminds users that the high energy consumption of kettles has collective consequences. Through the mediation of this device, infrastructure is reframed as a system that modulates energy demand, supporting a more economical use of electricity. More broadly, it suggests a model through which infrastructure itself may be granted a greater degree of agency.

Figure 5.12

A smart kettle that depends on the electrical infrastructure rather than individual convenience.



Note. [Photograph] Courtesy of Shane Smidt (Smidt, 2016).

The project is not yet fully resolved but already offers a compelling vision in terms of process, symmetry, and network. In terms of process, it demonstrates the possibility of using technology as an agent of co-individuation. Drawing on Simondon (2020), the kettle becomes an *allagmatic operator* that converts the operation of making tea into the infrastructure of a neighbourhood collective. Such an operation ‘defines a certain convertibility of operation into structure and of structure into operation’ (p.559). It does so by orienting the operation towards the collective, thereby transforming the ‘I’ into the ‘we’ through their mutual relation within the shared pre-individual milieu of the National Grid, making the household ritual part of a broader social and material order.

The symmetrical role of the kettle is demonstrated by the capacity to make an object that makes visible the constraints of the infrastructure. The allagmatic operation takes the user’s desire for tea and shapes it into the capacity of the grid. This approach counters the morality typically attributed to the object by shifting the focus from the kettle and the user to the underlying issue.¹⁷ A moral machine would function as Grossman’s ‘safety catch’ (1995), previously discussed. Grossman interprets individuality as an obstacle

¹⁷ The morality of the object is further examined in section 7.3.1

and positions training as the solution to the aim of the soldier. This perspective imposes a deindividuating relation that strips the user of autonomy. By contrast, through transindividuality, the kettle is understood as a co-individuation with technology, through a negotiation between the needs of the user and the capacity of the electrical network which happens across a neighbourhood, enabling the user to relate to the collective.

Table 5.2

A smart kettle in terms of process, symmetry and network

Process	Symmetry	Network
Co-individuation between people in the neighbourhood through the infrastructure	The kettle gives agency to the infrastructure (the Creed).	The kettle acts as third force to the neighbourhood.

As discussed in section 5.2.2, the monster is a matter of placing the responsibility where it should be. It's not a question of blaming the individual but letting them know about the capacity of the infrastructure. In this respect, a strength of the project lies in making the relation to the collective visible while rendering it relatable through the scale of the neighbourhood. The precise scale of this area is not fully addressed, but it could be further refined through data collection to better account for the synchronicity of electrical use. Furthermore, the user interface is not addressed, although I believe it would be important for communicating the capacity of the infrastructure, for example by indicating the number of people in the queue rather than its availability. This is an important aspect of performativity, which calls for a stronger alignment between the machine and the reality it represents.

Using technological relatedness as an approach requires new ways to cope with increased frustration due to the reduced convenience of the user in the hope that it will foster a more sustainable engagement. This would change the user's perception of energy into something that needs to be collected and prepared, rather than simply activated and supplied. Relatedness through training progressively moves the user from their position of convenience to a collective understanding of the grid. This shift facilitates the transition to a different mode of use, moving from the scale of the home to that of an area.

5.3.2 Discussion: Reframing Sustainability in Interaction Design through Technological Relatedness

Interaction design is often approached at the level of micro-interactions, focusing on the immediate use of technology. When considering technological relatedness, however, the consequences of our actions should become more explicit. In the context of sustainability, the role of technology is therefore to reduce, slow down, and potentially limit use, as a means of training users to perceive the world as a space of constraints rather than one of endless extraction. At this level, technology is not merely a supporting tool but part of a chain of relations, a relay integrated with humans within a collective. I begin by examining the current treatment of sustainability in interaction design, then demonstrate how the concept of mediation can be extended through transindividuality.

In interaction design, the slowing down of interaction is often conceived as friction, a means of influencing behaviour by drawing attention to everyday personal choices (Laschke et al., 2014). Technological relatedness, however, approaches this differently, through the acknowledgement of a network that includes a multiplicity of actors. In the context of sustainability, this shifts the focus away from immediacy and individual choice towards a collective experience of waiting. Frustration is already embedded in everyday life, as seen in common situations such as queuing to enter a shop or waiting to cross the street. As such, it is not simply a negative condition, but one that can be designed for and engaged with. Returning to the example of the kettle, one missing element is a mapping of the area, which would provide users with a sense of surrounding activity and greater transparency in how the queue is collectively managed. In this sense, frustration is not merely the loss of time, but a form of engagement with the neighbourhood that may evolve into a social practice.

The issue of sustainability in interaction design is critical, as it has been positioned as an area of positive persuasiveness. Brynjarsdóttir et al. (2012) undertake a critical analysis of persuasive sustainability papers published between 2009 and 2011, and find that ‘persuasive sustainability aims to change behaviour related to sustainability, generally understood as reducing individual resource consumption; the nature of the expected behavioural change is often unspecified. Persuasive sustainability systems generally aim to do so by raising individual awareness of the consequence of their activity’ (Brynjarsdóttir et al., 2012, p.949). Viewing sustainability as an individual issue is, at the very least,

contentious (Maniates, 2001), as most research indicates that sustainability is primarily a systemic problem rooted in the way society is organised around extractive energies. This does not mean there is nothing we can do at an individual level but, unless society creates the conditions for change, the perception that collective action is what needs fixing will persist. This misrepresentation has led to the development of numerous designed applications that do little to challenge the status quo, such as social networking platforms sharing environmental data (Brynjarsdóttir et al., 2012, p.948). Here, the persuasive approach involves getting data and showing it to the user in real-time, so they can make conscious decisions. In this sense, sustainability is viewed through an instrumentalist lens where ‘something is made available by technology if it has been rendered instantaneous, ubiquitous, safe, and easy’ (Borgman, 1984, p.41). Instead, I suggest that this view needs to be challenged, as exemplified by Smidt’s Smart Kettle (2016), which slows down the process of accessing electricity to remind users of the fragility of the infrastructure.

According to Bazzano (2025), two errors persist: the error of psychologism, which sees only the individual and the interindividual, and the error of sociologism, which sees only the intersocial and reduces phenomena to mutual interactions. When approached through social practice, everyday actions such as drying laundry outdoors may appear mundane or even disorderly, yet they signify a concrete search for sustainable solutions made visible to others (see Shove, 2003). Such practices reveal pre-individual dimensions that become perceptible at the collective level. From this perspective, technology can act as a negative agent, shifting practices from hanging clothes out to dry to the use of machines. Social practice, however, highlights the value of doing things collectively and foregrounds our relationship with the environment, thereby initiating co-individuation within a shared milieu. It demonstrates that the individual and society are not separate but intertwined, engaged in constant communication.

The role of technological relatedness through training is to act as a mediator that facilitates the transformation of the individual towards the collective. From this perspective, it positions itself between persuasive technologies, which focus on influencing behaviour through the use of technology, and a social practice approach, which emphasises the formation of social networks. As Simondon (2017) suggests, the technical object, once taken up by a human subject, becomes the support and symbol of a transindividual relation. It is therefore not a moral object with a fixed inscription, a mould, as implied in persuasive technologies, but one that operates through modulation. To be

effective, technological relatedness relies on three key dimensions: process, symmetry, and network. The process draws on transindividuality to orient technological engagement towards the collective. It materialises as an allagmatic operator (Simondon, 2020), one that connects the system with the operation. Symmetry is expressed through the increased agency of infrastructure, through its capacity, which is mediated through a device, such as the kettle. Finally, the network is made visible through mappings of surrounding activities, allowing users to perceive how infrastructure operates in relation to their individual demand.

5.5 Summary

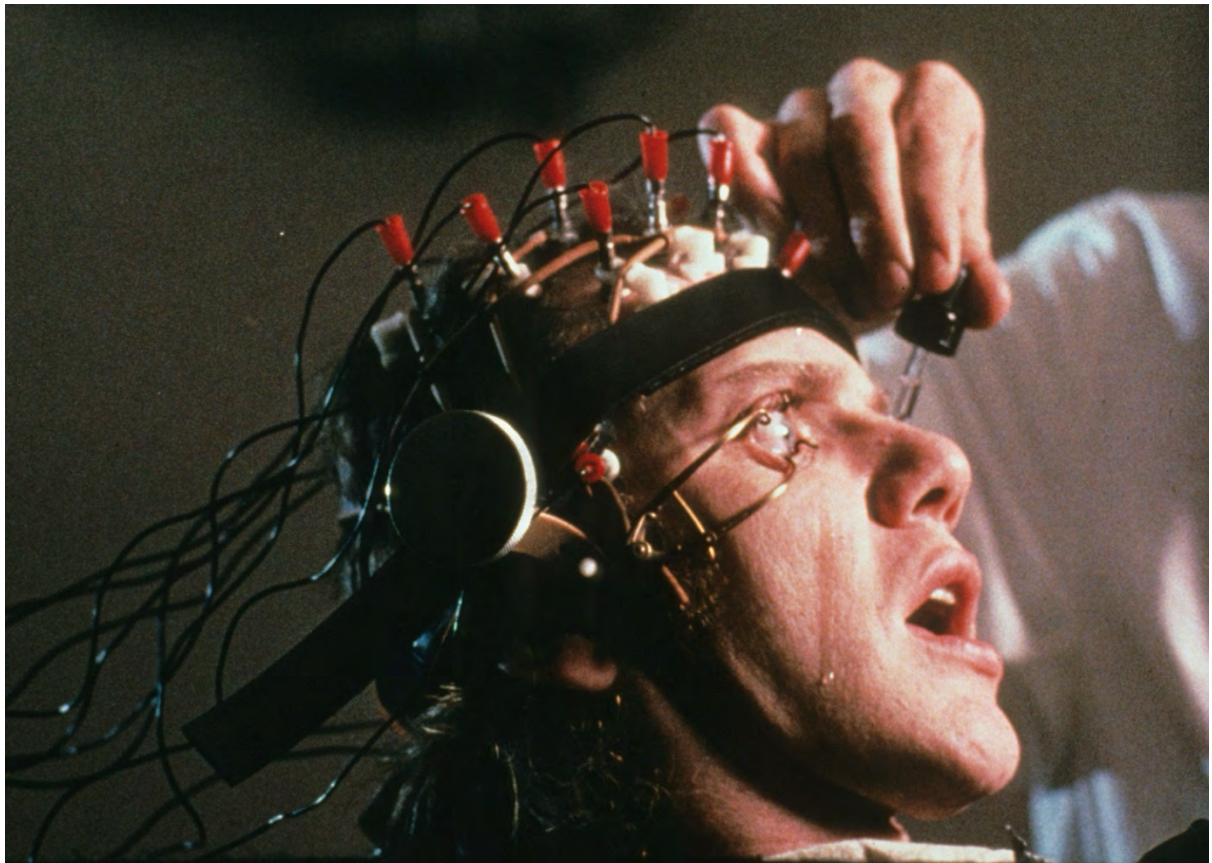
In this first case study, I analyse the character of Pyle as an entanglement of power and care, two dominant yet limited frameworks often reflected in interaction design. His suicide, however, introduces a third force that extends the analysis beyond the individual, revealing broader societal implications of violence and weapon use. The rifle, as a performative prop, demonstrates the importance of material engagement, showing that understanding technology requires confronting its consequences. This performative relationship (RQ1) is embodied in the Marine Creed, a ritual that gradually shifts agency from the individual soldier to a shared relation with the weapon, reframing training as a form of care for the object. I problematise the relationship between aiming and shooting, showing that training operates at both individual and societal levels. Military strategies such as desensitisation address this gap but introduce further ethical concerns.

Through speculative affiliation (RQ2), I examine the key social issue that the enacted prop performs in the film and whether this issue is addressed or resolved by other props in other films. While examples such as *Star Trek* and *Westworld* attempt to mitigate violence through technical constraints, they remain limited by their focus on the object itself. In contrast, *Star Wars* proposes an extended training model, where mastery of the object also involves aligning with nature. This leads to a reconsideration of responsibility, where both the rifle and the training system contribute to acts of violence, and where the failure lies not in the individual but in the conditions of care. Drawing on Latour (2011), I argue that we should not confuse the creator with the creature, the army's training for Pyle. Contrary to the actor's portrayal of Pyle, the true 'monster' lies not within the character of Pyle, but in the failure to provide adequate care for the soldier

Finally, I develop the concept of technological relatedness (RQ3) as an approach that makes the consequences of technology explicit through design. I illustrate this with a speculative device that mediates the relationship between users and energy infrastructure, where electricity is distributed sequentially rather than on demand. By introducing friction, it transforms energy into a collectively managed process. This allows me to reconsider sustainability in interaction design by proposing the allagmatic operator (Simondon, 2020) that mediates between the individual and an infrastructure.

Chapter Six

The Ludovico Treatment: Technological Relatedness through Control as Plurality



Note. [Photograph] Malcolm McDowell on the set of *A Clockwork Orange*. Copyright Pictorial Press Ltd / Alamy Stock Photos.

In this second case study, I examine technological relatedness through the lens of control as plurality. Freedom is a fragile concept, often constrained by the drive for efficiency that shapes modern societies. In the context of crisis, such as climate change, freedom may even be curtailed in the name of the collective good. I propose reconceptualising control as a mode of engagement with the collective, involving both the user and the intelligent machine in establishing technological relatedness as a process of co-individuation. I foreground control as plurality as a technological approach that emphasises the cultivation of virtue over mere conditioning (MacIntyre, 1981/2007). The film *A Clockwork Orange* (ACO) presents a technology that appears to resolve youth delinquency but does so at the cost of individual freedom. While addressing a legitimate issue, the treatment exposes the limitations of relying solely on technical solutions to solve complex problems. In the context of the film, the Ludovico Treatment is an assemblage of technologies that materialises this contradiction as the film combines a critique of techno-utopianism and social-utopianism, exploring the role of technology in shaping an ideal society. Consequently, this chapter explores how to foster better cohabitation with other humans and non-human by enabling strong interventions when necessary and softer interventions when human involvement is less critical. It facilitates the shift from perceiving technology merely as a tool to conceptualising it as a social agent.

The prop, the Ludovico Treatment, is examined for both its thematic and situated qualities. Thematically, it raises crucial questions about the role of technology as a means of control and its complex relationship with freedom. As a situated object, the performance is composed of multiple elements, forming a fragile assemblage that was physically demanding for the actor. Investigating its origin introduces a secondary theme centred on the pain inflicted during the performance. The technological relatedness emerging from this analysis calls for a refinement of our understanding of the common, while also seeking a new conception of freedom grounded in ecological necessity. The motivation for investigating the Ludovico Treatment is identified through the black box, from two perspectives. The first is the governmental and medical standpoint that sees the breakdown of the technology conceived. The second is from the main character's viewpoint, through the realisation of his loss of ability to respond to others' violence, rendering him unable to defend himself. Both converge in the Ludovico Treatment as the key object. The research seeks an understanding of technology that is performative, initially through analysis and subsequently as a key question, employing the concept of a performative relationship. The

film itself is performative, showcasing a technology that ostensibly resolves a complex societal issue, only to later critique and denounce it, but the performativity is also in the relation between the actor and the prop. Through an actor-network theory (ANT) analysis, I find that the pain depicted in the film is more than mere fiction. This new narrative identifies the author's pain as a persistent element originating in his life, lingering in his writing, transferring to the characters through the use of props, and, surprisingly, infiltrating the stage. I identify the performative relationship as 'pain as a common' (my own term). It is a paradoxically shared experience that originates from social actors outside the film and impacts the actors themselves. I use these concepts to present a solution in terms of relatedness within the context of sustainable interaction technology. This aims to demonstrate that the original purpose of control can be reconfigured in alternative ways.

I begin this chapter by examining the main character, Alex, through a socio-material lens.¹ The inspiration for the book and movie is a violent act perpetrated against the family of the author, Anthony Burgess. I demonstrate that this act was given *durability* through the naming of characters in a movie that transcends reality and fiction (Section 6.1.1). I then turn to the materialisation of the Ludovico machine, to show the development of a medical machine as a *boundary object*, an object that crosses two networks: medical reality and medical fiction (Section 6.1.2). While considerable research has been conducted on the film itself, particularly regarding the level of violence and its potential impact on society,² there is a notable absence of studies exploring the connection between the violence depicted in fiction and the violence enacted on the stage during production. I argue that the performative relationship (RQ1) between the character and the treatment stems from a lingering pain that predates the film, enacted within the film, and further experienced by the actor through multiple on-set accidents. I argue that it generates a new form of common, centred around pain (Section 6.1.3). The section ends with a discussion which is central to the film and still resonates with current technologies, the opposition between free will and behavioural engineering which is central to the movie. I explore the object's mediation in terms of control and its relation to violence (Section 6.1.4). In the affiliation of the object (RQ2), this study examines other attempts to resolve the issue by analysing carceral technologies through enacted technologies in science fiction. These

¹ I use the term socio-material as the co-constitution between human and non-human, a fictional character and a historical character in this case.

² The movie was withdrawn from cinemas by Kubrick in 1973 and only became available again after the death of Kubrick in 1999 (Bradshaw, 2019).

technologies enact a society where the separation between the body and the brain becomes increasingly pronounced (Section 6.2.1). In the discussion, the possibilities of going beyond instrumentalisation are examined through the work of Alasdair MacIntyre (Section 6.2.2). In the last section, I examine the technological relatedness (RQ3) to propose a technology that uses the theme of pain from ACO as a foundation for a common (Section 6.3.1). Relatedness is examined as a cosmogram, a technology that fosters cohabitation with technology by enabling strong interventions when necessary and softer interventions when human involvement is less critical. In this chapter, I use the Stanley Kubrick Archive, the novel *A Clockwork Orange* (1962) by Anthony Burgess, the film itself, and the many visual and written references on the film.

6.1 Formation: ‘Alex’ and The Ludovico Treatment

The relationship between Alex and the Ludovico Treatment is a medical one, designed to control and suppress his violent behaviour, ultimately rendering him incapable of defending himself. In the formation, I examine the main character through the significance of his name, demonstrating how naming functions as a socio-material element that bridges fiction and reality. The study of the prop, the Ludovico Treatment, reveals an assemblage of both medical reality and fiction. I investigate this duality through the notion of boundary objects (Trompette & Vinck, 2009) to demonstrate the role of the object in connecting networks and transmitting pain.³ The performative relationship reveals this new dynamic, which I refer to as ‘pain as a common’ (RQ1). In the discussion, I reflect on the role of technology as depicted in the film and the opposition between two concepts: control, represented by B.F. Skinner, and freedom, advocated by the author, Burgess. Instead, I argue that examining the Ludovico Treatment is an opportunity to reconcile the individual and the collective into an ecological necessity (Latour & Lenton, 2019).

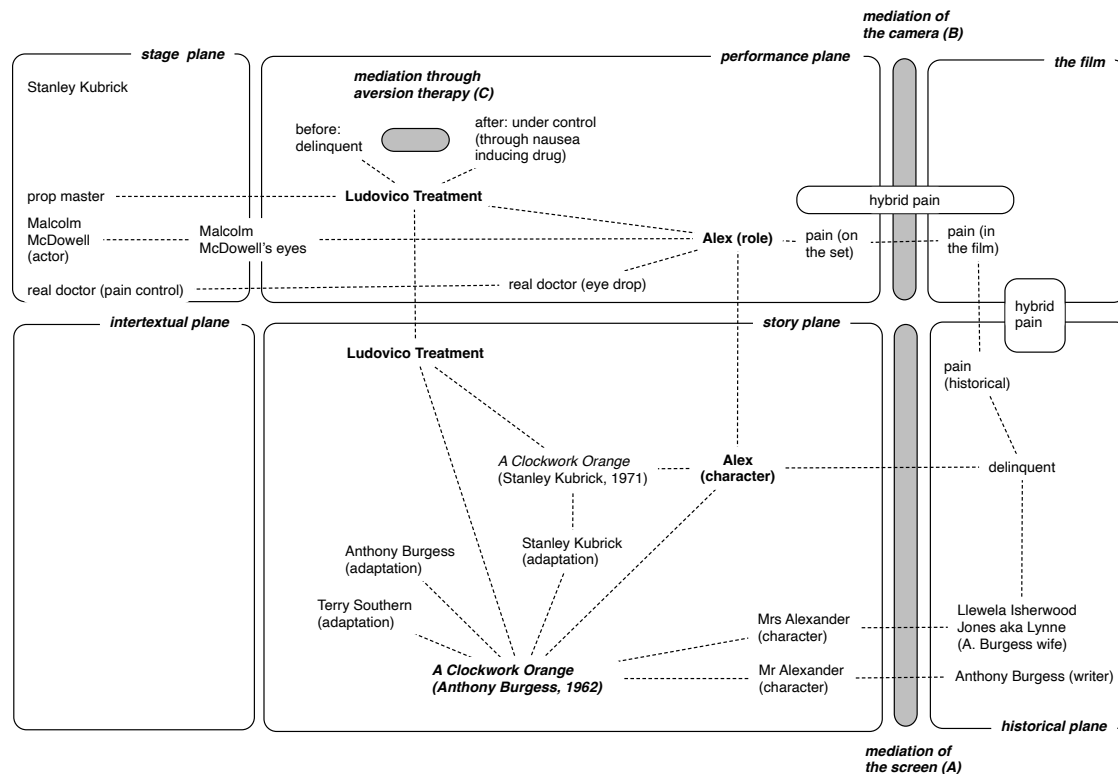
The section narrative of *A Clockwork Orange* provides the elements to build an alternative narrative focusing on the mediation of the Ludovico Treatment (Figure 6.1). The analysis highlights two key themes. The first demonstrates that the pain of the character Alex, when receiving the Ludovico Treatment, is not purely cinematographic but rather hybrid, as it intersects multiple planes: historical, narrative, performative, and cinematic. The historical plane refers to the violent attack on Anthony Burgess’ wife, Lynn. The story plane encompasses the depiction of violence and rape in the film. The performance and

³ The boundary object was originally developed as a competing notion to ANT (Star & Griesemer, 1989).

the cinematic plane are where this pain is acted out, but, unexpectedly, it also extends to the stage, as both an actress and actor were physically injured during filming. The second theme demonstrates that the Ludovico Treatment is a hybrid, blending elements of medical reality, albeit a tenuous one, with medical fiction.

Figure 6.1

The section narrative shows the planes that contribute to the mediation of Alex and the Ludovico Treatment.



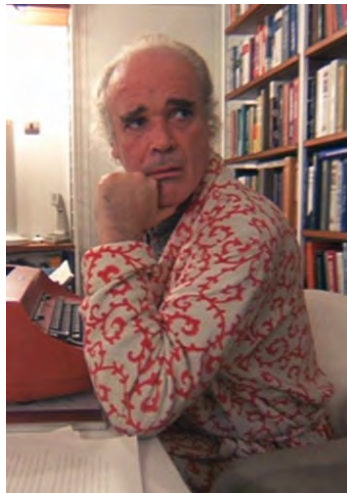
The formation of Alex and the Ludovico Treatment is closely tied to the impact of the attack on Burgess's wife, Lynne Burgess. I firstly establish the relationship between the performance plane, the story plane, and the historical plane. To do so, I draw on Burgess's biography (1990) and magazine interviews (1973; 1974), as well as film stills and photographs from the film and the Burgess archive, which provide insights into the characterisation of Alex in relation to Burgess. Secondly, I examine the process through which this transmission occurred in the making of the Ludovico Treatment. My research is based on material from the SKA, specifically letters from production manager Bernard Williams, such as SK/13/2/1/19, which contains a list of props, and SK/13/2/15, which warns Kubrick about the risk of infection (both available in Appendix A). Additionally, I incorporate published interviews with actors (Hoad, 2019), documentaries (Joyce, 1996), and books on Kubrick (Walker, 1972) to provide a range of perspectives.

6.1.1 Looking for ‘Alex’

The naming of a character is a minor yet significant aspect of the characterisation. From an ANT perspective, naming is a process of inscription that reveals the network of relations behind what might otherwise appear as an author’s creative choice. It operates as a relay between social actors. I examine this process through the concept of durability, which refers to the capacity of objects to stabilise and maintain strong social connections over time (Latour, 1990). For example, a document can facilitate the transition between day and night nurses, creating continuity in their function. Applying this concept to the development of ACO, I consider durability as a means of maintaining a relationship between social actors, such as the author, and fictional characters.

Figure 6.2 and Figure 6.3

Anthony Burgess and Mr Alexander (Patrick Magee) pictured in front of their typewriters.



Note. Left: [Photograph], Bauer, J. (Photographer). (1970). Anthony Burgess in Rome. Copyright Jerry Bauer Estate.

Right: [Film Still] Kubrick, S. (Director). (1971). *A Clockwork Orange* [Film]. Warner Bros. and Polaris Production.

A socio-material approach to naming reveals it as embedded within a network of relations. In an interview, Burgess (1973) explains that he named the main character Alex because of its international quality, an explanation that remains somewhat evasive, as is often the case with authors and directors. In contrast, I argue that naming performs a socio-material function, linking multiple planes: historical, narrative, performative, and cinematic. Through this act, the name connects the character to a broader network of references, suggesting an intention to confer durability upon the character. This is made

explicit when, upon arrival at the prison, Alex refers to himself as Alexander de Large.⁴ The name indicates a relationship between the preparator and the victim. In addition to the character of Alex, there are two other uses of the name in the film, Mr Alexander (Figure 6.3) and his wife Mrs Alexander, who are beaten and raped by the gang led by Alex. One is a first name, Alex, while the other is a last name, Alexander, as if they are meant to complete each other. This is not a coincidence or a literary exercise but a way to link all these versions of Alex through one event that changed their lives.

Figure 6.4

A newspaper with the name 'Burgess' (top right corner)



Note. [Film Still] Kubrick, S. (Director). (1971). *A Clockwork Orange* [Film]. Warner Bros. and Polaris Production.

The relation goes further, as the Alexander family, a fictional family, shares aspects of the dramatic fate experienced by the family of the author, the Burgesses. During the Second World War, Burgess' wife, Lynne Burgess, was the victim of an attack in London by four American soldiers. In an interview, Burgess states that 'it wasn't a sexual attack, it was an attack for robbery' (Un Bellissimo Messaggio, 1974) but the result of the attack was a miscarriage: 'she lost the child she was carrying at the time and her health deteriorated, and I suppose her eventual death was initiated by this act of violence' (Un Bellissimo Messaggio, 1974). In the same interview, Burgess admits that he wrote about events from his own life to purge them, 'to catharise the pain, the anguish, in a work of art' (1974). The relation between the fiction and reality suggests the durability of the character as a means

⁴ In the book, we learn his full name is Alexander *the* Large while he is attacking two girls (Burgess, 1962/1995). There isn't much to say about this small difference but, according to Burgess (1990), the name Alex the Large is a reference to Alexander the Great.

to bring a personal story to the fiction. The support this argument, the occupation of Mr Alexander is also a writer (Figure 6.3), just like Burgess (Figure 6.2). Additionally, there are hidden references to the author in a prop newspaper (Figure 6.4). The prop, made by Kubrick, appears to be a simple homage in passing to the writer, but I argue that it is a reference which extends the durability of the author's reality to the fiction.

6.1.2 Materialising the Ludovico Treatment

Wires are attached to various parts of his body. Clips are put over his eyes so that he cannot shut them.
(Southern & Cooper, 1966).

The study of the Ludovico Treatment reveals an assemblage of both fictional and actual elements. As a fictional object, it embodies the contradictory nature of technology: while it is intended to easily solve a social issue, youth delinquency, it simultaneously creates new issues, such as reducing individual freedom and increasing the character's vulnerability. I investigate this opposition through the notion of the boundary object. Such an object is understood as a region, a network, or a fluid, addressing the discontinuity between an object's presence and absence (Trompette & Vinck, 2009). This perspective highlights the fragility of the boundary between two networks: medical science and medical fiction. When these networks are combined, the object can yield uncertain outcomes. Specifically, the treatment in the fiction not only induces pain but also has the potential to extend across networks, generating real pain on the stage. I firstly compare the Ludovico Treatment to an existing medical procedure to illustrate the extent to which science is embedded in the fiction. I then analyse the hybrid materiality the Ludovico Treatment, demonstrating how the blend of fictional and real medical elements creates uncertainty.

The scientific inspiration for the Ludovico Treatment is given in the novel (1962) and film (1971): aversion therapy. This treatment had been known in Britain since the late 1940s (Hadley, 1985, p.4).⁵ In behaviourist theory, it is presented as 'the intent is to decrease the frequency of an undesired response' (Hadley, 1985, p.7). This contrasts with the portrayal in the film where it is depicted as a penalty imposed for performing a socially unacceptable act. This is an important distinction, as the experiment happens in a prison, and the

⁵ Behaviourism is a systematic approach to understanding the behaviour of humans by measuring only observable behaviours and events. Ivan Pavlov (1849-1936), a Soviet experimental psychologist, is known for the discovery of behavioral conditioning.

behavioural punishment (the aversion therapy) is not a societal punishment (the prison). This confusion has not helped the reputation of aversion therapy. However, the bad reputation of this form of therapy is due to its use as a tool of repression, particularly for gay men, as it was used when homosexuality was illegal in Britain (Smith et al., 2004). The idea of aversive treatment came from a change in the law of the UK. According to Charles Unsworth, 'the Mental Health Act 1959 (UK) reflects the state's ideological departure from the classical liberal emphasis on autonomy that drove the Lunacy Act 1890, toward the collectivist and interventionist objective of the post-war, therapeutic welfare state' (1987),⁶ a change Burgess acknowledges in his novel through his exposition of morality.

The choice of this therapy originates with Burgess, who strongly opposed it, particularly in relation to the work of Skinner (Newman, 1991). Skinner was a prominent figure in the behavioural engineering movement in the United States, influencing the field from the 1930s to the 1990s. While behaviourism primarily aims to understand the behaviour of animals and humans, Skinner focused on applying it as a form of social engineering where society would benefit from placing the design of culture in the hands of behavioural engineers (Skinner, 1976/2005). He expressed his vision in the novel *Walden II*, in which he develops the ideal community determined by behavioural science.⁷ There is a parallel to be drawn with persuasive computing technology, developed by B.J. Fogg, which was initially designed to enhance individual behaviour but later expanded into social engineering with the rise of social media (Orlowski, 2020; Frischmann & Selinger, 2019). As a prop, it conveys many opposing views, such as that of Burgess, who uses it to condemn the societal impact of such a therapy.

The Ludovico Treatment is a hybrid of props, serving multiple functions and actions for the benefit of the performance of the actor, the film's narrative or both (Table 6.1). Terry Southern, who wrote a first adaptation, describes the scene: 'Two men take Alex and strap him to the chair, described as a complicated process: "Wires are attached to various parts of his body. Clips are put over his eyes so that he cannot shut them"' (Southern & Cooper, 1966). The treatment results in an assemblage of things (Table 6.1) that can be put in two categories. Those visible in the film include the serum (1) (Figure 6.7), a

⁶ This is further explored in Sections 6.1.4 and 6.2.2, where technology is conceived in relation to freedom.

⁷ The book was published in 1948. The title is a reference to another book called *Walden*, written by Henry David Thoreau in 1854, which also inspired a utopian novel written by Edward Bellamy called *Looking Backward 2000-1887* (1888).

set of lid clamps⁸ to keep the eye open (2) (Figure 6.5), and electrodes placed on the head (3) (Figure 6.6). Kubrick and his production manager were in contact with the Moorfield Eye Hospital where they were advised to use cornea lubricating drops (4), and local anaesthetic to insert the lid clamps (5) (Figure 6.6). Further recommendation came from Dr M.F. Gundry (SK/13/2/1/19) who suggested using a three-minute sterile unit (6) and providing the actor with sunglasses (7) after filming the sequence.

Table 6.1

The Ludovico Treatment is an assemblage of props, mixing reality and fiction.

Name	Performance prop (actor)	Enacted technology (fiction)	Medical Care	Editing	Aversion therapy
serum (1)		x			
lid clamps (2)	x				
electrodes and scalp cap (3)		x			x
cornea lubricating drops (4)	x		x		
local anaesthetic (5)	x		x		
sterile unit (6)	x		x		
morphine / sunglasses (7)			x		
nurse (8)	x		x		x
doctor (9)	x	x	x		x
encephalography machine (10)			x		
violent films (11)				x	

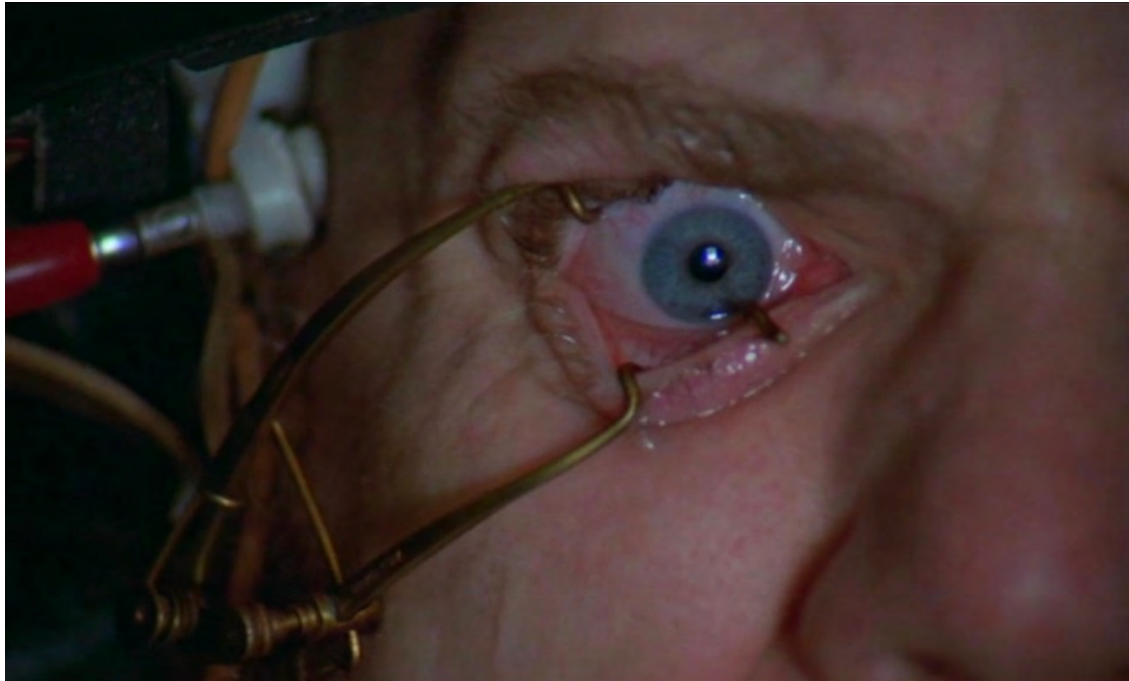
The production manager asked for the assistance of a nurse, ‘a sister’ (8), for the day (Figure 6.8). The nurse doesn’t appear in the film but was likely to have been on stage. The doctor, however, is part of the film. He is seen putting the lid clamps on and delivering the eye drops. In the letter, there is mention of the fee for the doctor for his assistance and professional advice (SK/13/2/1/19), which puts him both on stage as a consultant and in the performance as an actor. Kubrick also procured some instruments. In a letter to the production manager, Kubrick mentions Mr Lee of Sierx, who makes an electro-

⁸ Sometimes referred to as ‘lid locks’ in the archives.

encephalography readout machine (10), with electrodes and a scalp cap that holds them down (SK/13/2/1/19). The treatment is not a scientific account of reality but presents itself as an object for public discussion.

Figure 6.5

A Close-up on Alex and the eye-lid clamps



Note. [Film Still] Kubrick, S. (Director). (1971). A Clockwork Orange [Film]. Warner Bros. and Polaris Production.

Figure 6.6 and Figure 6.7

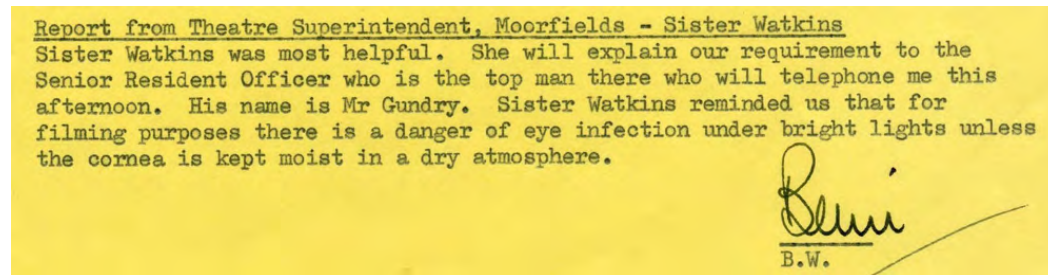
The Ludovico Treatment is an assemblage of things. Left: Alex and the Ludovico Treatment, right: the serum



Note. Left: [Photograph] Copyright Pictorial Press Ltd / Alamy Stock Photos. Right: [Film Still] Kubrick, S. (Director). (1971). A Clockwork Orange [Film]. Warner Bros. and Polaris Production.

Figure 6.8

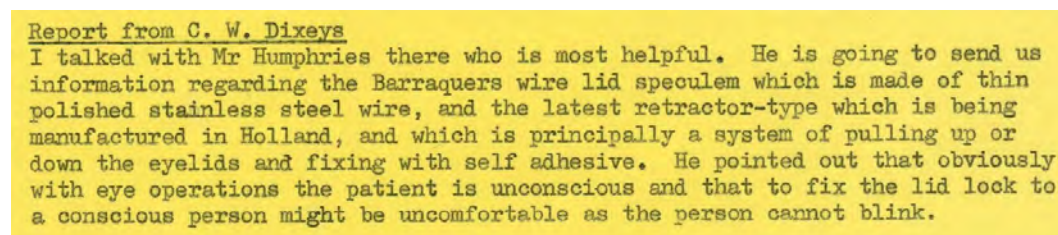
Excerpt of a letter from the production designer to Stanley Kubrick (signed Bernie Williams)



Note. [Letter]. Courtesy of The Stanley Kubrick Archive (SK/13/2/1/19). Archives and Special Collections Centre, University of the Arts London, United Kingdom.

Figure 6.9

Excerpt of a letter from the production designer to Stanley Kubrick (see Annex A)



Note. [Letter]. Courtesy of The Stanley Kubrick Archive (SK/13/2/1/19). Archives and Special Collections Centre, University of the Arts London, United Kingdom.

The fictional materialisation of a scientific device involves numerous design choices that not only shape its visual representation but also carry potential risks. As is often the case with props, some are designed to appear authentic while remaining harmless on stage. For instance, the serum (1) injected into the actor in the scene was most likely saline water, having no actual effect on him. However, the local anaesthetic (5) given to the actor was real and was used to reduce the pain from the lid clamps (2). The clamps were real and had a tangible impact on the actor, Malcolm McDowell, making him extremely nervous and ultimately leading him to scratch his eyes (Walker, 1972). As medical devices their agency could be attenuated through anaesthetic but not entirely removed. According to a letter from the production manager to Stanley Kubrick (SK/13/2/1/19), the eye procedure should have been performed on someone unconscious (Figure 6.9), but this did not align with the film's intention of portraying the character's pain on screen.

The notion of boundary objects applies differently to props depending on the networks they connect. Some function as relational objects, aiding the actor's transition back to everyday life, while others operate as relational props (my own term), facilitating the connection between actor and character. The lid clamps, for example, function as relational props, as their impact extends to the stage. The object operates within two

distinct networks: within the film, it evokes an image reminiscent of torture, while as a performance tool, it makes the actor's work physically demanding. In contrast, the sunglasses serve as relational objects, assisting the actor after filming (Joyce, 1986). Along with the morphine, the sunglasses are not props in the cinematic sense—they are not visible on screen—but are nonetheless part of the assemblage required to produce the Ludovico Treatment. While these elements did not contribute to the visual aesthetic of the film, they enabled the actor to protect his eyes and reduce pain, thereby countering the agency of the relational props—in this case, the lid clamps—used in the scene.

Figure 6.10

Image sequence showing the Doctor (Dr Gundry) putting the eye-lid clamps into Alex's Eyes.



Note. [Film Stills]. Kubrick, S. (Director). (1971). *A Clockwork Orange* [Film]. Warner Bros. and Polaris Production.

The doctor sitting next to McDowell plays a role that also transcends the boundary (Figure 6.10; Figure 6.11) between fictional and real medicine. In the film, he plays a silent role that supports the Ludovico Treatment. During the performance, he wears a white coat but remains silent, unlike the other actors portraying doctors. In cinema, since he has no lines, he is classified as an extra. However, he is more than an extra, as he plays a crucial role in ensuring the actor's well-being by delivering the cornea lubricating drops (4).⁹ His

⁹ Initially, the doctor had one line: 'What is your name?' and McDowell said he was more nervous about it than putting the eye-lid clamps on, which made McDowell even more nervous (Walker, 1972).

role is essential to the setup of the lid clamps on screen, as it is a highly delicate task, warranting the presence of a professional on set. On the stage, his presence provides reassurance, offering a sense of security to the actor, but he simultaneously serves as a reminder that the filming process carried a real risk. The Ludovico assemblage is made of objects of no consequence, as with most film props, but also objects with serious consequences which required the involvement of a professional doctor to care for the well-being of the actor.

Figure 6.11

From left to right (sitting): Stanley Kubrick, Malcolm McDowell and Dr Gundry.



Note. [Photograph]. Courtesy of The Stanley Kubrick Archive (SK/13/9/1/1). Archives and Special Collections Centre, University of the Arts London, United Kingdom.

Unpacking the Ludovico Treatment provides insight into the complex assemblage of real and fictional materials. Using the notion of a boundary object, I examine the dangers of blurring the lines between medical science and medical fiction, particularly how this crossover caused unnecessary pain to the actor. A relational prop such as the lid clamp may support the actor's performance, but it does so at a cost, often requiring additional objects to protect the actor's eyes and mitigate physical discomfort. While the

setup involved nothing more than wires and clips placed over his eyes (Southern & Cooper, 1966), the use of props failed to attenuate reality. A similar issue arises when technologies are considered solely as tools for individuals, such as persuasive technologies, then extend beyond personal influence, becoming forms of behavioural technology.

6.1.3 The Ludovico Treatment in Action: A Performative Relationship

The formation presents a unique case, where the performance of the actor in a film about violence is mixed with his personal experience of pain on the stage. The key object, the Ludovico Treatment, is identified as a boundary object that allows these transfers through an assemblage of medical reality and fiction. The performative relationship in ACO reveals a new dynamic between people and objects, which I refer to as 'pain as a common' (RQ1). Rather than understanding these transfers as a deterministic sequence, one after the other, the concept of the common facilitates a discussion that problematizes both the act, in this case, violence, and its consequence, pain, as issues that are never fully resolved. I examine the concept of a common as a challenge that must be assembled and negotiated (Blaser & de la Cadena, 2017). I describe the situation on the set to present the performative relationship.

The common is simple to understand but complex to implement. Certain resources, such as water, require collective management, ensuring that all parties consider and care for each other's needs. Elinor Ostrom demonstrates that when the management of resources benefits a community, it also benefits individuals within that community (Rabinowitz, 2010). Additionally, a common is not something that exist on its own but must be actively brought together, as demonstrated by the concept 'uncommon' (Blaser & de la Cadena, 2017). This approach applies particularly well to this case, where the planes (historical, story, performance) do not naturally relate to each other and the people involved are separated. However, since the violence is never contained, the writer, the character, the director, and the actors continue to exploit the common.

The film reveals how violence can circulate beyond the individual, contributing to collective patterns of imitation. ACO has been widely criticised for its association with copycat acts of violence, a backlash that ultimately led Kubrick to withdraw the film from circulation.¹⁰ Pain as a common offers an alternative reading, in which violence, once

¹⁰ In 1973, Kubrick withdrew ACO from circulation in the UK due to concerns over reports of copycat violence (BBFC, n.d.). For further discussion on the development of this reputation, see Joseph Darlington (2016).

internalised, circulates beyond the individual as an unresolved collective dynamic. The origin of pain, situated in the historical plane, is internalised through the story plane, then translated into embodied experience through performance, and ultimately rearticulated as cinematic pain. Ultimately, the pain as a common operates as a paradoxical approach, where pain is not collectively addressed but instead accumulates by ignoring its underlying causes, allowing it to spread from one network to another. This internalisation constitutes a common. While the treatment could have been better designed to prevent physical pain, the performance did not necessitate the use of real violence. As one of the actors testifies, it did not have to be that way (Walker, 1972), Kubrick should have shown more care and caution in his approach.

The boundary between fiction and reality is ambiguous, and the difference between performance (the violence and pain for the camera) and performativity (the violence and pain on the set) is not clear when watching the movie. On the set, McDowell was put in a difficult situation, where his eyes had to remain open for a long time (Figure 6.11) until one of his performances was interrupted when the instrument scratched his cornea and shooting had to stop (Hoad, 2019). Looking at the equipment before the shoot, McDowell said to Kubrick: 'My god, you're not expecting me to do this, are you?', to which Kubrick replied: 'You'll be fine, we've got a doctor from Moorfields Eye Hospital along' (Joyce, 1986). McDowell talked to the doctor who told him it was for delicate eye operations, normally with the patient on their back. As suggested, the treatment is a hybrid of science and fiction, but the consequences were real. McDowell continued: 'So I'm sitting up and they anaesthetise the eye, and put these things in. Because I couldn't feel a thing and just uncomfortable, and I wanted to get this scene over as fast as possible. And Stanley doesn't like me to say this but it's true [...]. The doctor had this bottle of artificial teardrops which he had to keep putting into my eyes otherwise I'd go blind'. This is an important testimony as it shows the disregard Kubrick had for the actor. McDowell continues: 'I go home, the anaesthetic wears off, I feel that I've been cut open by razor blades' (Joyce, 1986). According to Bernie Williams: 'Malcolm lost his patience, went "Eeargh!", reached up and knocked one of the clips across his eye and it scratched it' (Walker, 1972). From the producer's statement, one might feel it was an issue with McDowell more than the situation. This is only part of the controversy surrounding the film, as violence occurred in other moments of the movie as well.

The intensity of the violence portrayed in the film extends to the production, notably during the staging of the rape sequence in the Alexander house scene (Figure 6.12).

After many rehearsals, Kubrick suggested that McDowell incorporate a dance, prompting the actor to improvise a rendition of *Singing in the Rain* while assaulting Mr Alexander. McDowell said: 'I'm not a singer or a dancer but I had to choregraph the whole dammed thing and do it' (Joyce, 1986). In other interviews he recalled: 'I think we went through 50 canes, broke, every time I'd hit'. This suggests that a certain level of violence was normalised on the set. Another actor, Warren Clarks, reported: 'Before we had Adrienne [Corri] for the rape scene, we had another actress who got injured being bounced around on my shoulder. She was sore around the stomach and my shoulder was very painful too' (Grundy, 1997). The sequence calls for violence that spreads on the set. John Clive (Figure 6.13), the actor who played the man testing the Ludovico Treatment said that 'violence was there all the time. [...] I had to slap Malcolm across the face. I knew how to do that, in order to get the effect. So, we're rehearsing, and I don't hit him for real and Stanley stops it immediately'. According to Clive, Kubrick responded: 'Look, I want you to actually hit him. I want to see it for real'. Clive had to do the scene again and again until he 'hit Malcolm so hard that the snot flew out of his nose' (Walker, 1972). These testimonies reveal both the degree of freedom actors had on set and the extent to which they were encouraged to engage in violent actions, even towards fellow actors.

The performativity of pain as a common is evident, even though it is not always visible, it must be actively brought together. Unlike the 'uncommon', however, it does not come from negotiation (Blaser & de la Cadena, 2017), it requires finding what is in common (Latour, 2004), even if it hidden. It requires an origin, the violence on Mrs Burgess for example, but also a mediation, a story as a carrier for example, that eventually modifies the nature of the object such as the Ludovico Treatment. It is different from the common, where the importance is on the location and ability of the stakeholders to discuss the issue. According to Suchman et al. (2002), the performativity is a case where 'the socio-material relations are being reproduced and transformed' (p.164) and in this case, the violence is trivialised, it is for the performance, up to a point where it becomes part of the performance.

Figure 6.12

Alex with his cane and a Droog (Warren Clarke) carrying Mrs Alexander (Adrienne Corri) on his shoulder.



Note. [Film Still]. Kubrick, S. (Director). (1971). A Clockwork Orange [Film]. Warner Bros. and Polaris Production.

Figure 6.13

Alex being slapped by a man [John Clive] to test the Ludovico Treatment.



Note. [Film Still]. Kubrick, S. (Director). (1971). A Clockwork Orange [Film]. Warner Bros. and Polaris Production.

6.1.4 Discussion: Retracing the Opposition between Free Will and Behavioural Engineering.

In *A Clockwork Orange*, there is a man writing a treatise about moral philosophy, which is also called *A Clockwork Orange*, and Alex reads a sentence or two before tearing the typescript into big snowflakes: 'The attempt to impose upon man, a creature of growth and capable of sweetness... laws and conditions appropriate to a mechanised creation, against this I raise my sword-pen' (Lewis, 2002, p.128).

The theme of the film exposes the role of technology in relation to freedom. The Ludovico Treatment is an experiment that highlights the potential pitfalls of technology while also providing an opportunity to clarify the origins of the instrumentalisation of technology. Specifically, the treatment raises the issue of technology in terms of control which is crucial to understanding the mechanisation of the human before I make a counter proposal in term of relatedness. In the field of interaction design, there is limited reflection on the fact that any design involving technology inherently represent an attempt to control the user.¹¹ While it may not be harmful, behavioural engineering often lacks sufficient caution regarding the long-term consequences. There is value in shifting from an essentialist perspective, as seen in behavioural engineering, or a moral perspective focused on free will, toward a relational approach that prioritises the consequence over the use.

While the theme of film showcases behavioural technology as a means of control, it simultaneously exposes its consequences on individual freedom, revealing how such mechanisms shape, constrain, and ultimately redefine personal agency. At first, the technology is portrayed as benefiting society and reducing the pressure on the carceral system (Scene 29) but, as Alex's treatment is being tested, clear issues of individual autonomy begin to emerge (Scene 42). The relation between the individual and the collective is not always clear in behavioural engineering. For example, Fogg does not feel directly responsible for the social consequences of his technologies (Reitberger et al., 2012), whereas Zubof (2019) acknowledges that they are explicitly 'designed to influence and modify human behaviour at scale as the means of production is subordinated to a new and more complex means of behaviour modification' (p.17). The idea of solving any issue with technology, through instrumentalism, is tempting but also dangerous, if the consequences are considered. Burgess coined the term 'clockwork orange' as a critique of Skinner's ideas

¹¹ One counterexample is provided by the video *Uninvited Guests* (Superflux, 2015), which will be discussed in section 6.3.2.

about behavioural engineering. It echoes the notion of mechanical humanity which I use to illustrate a similar yet broader technological transformation.

Behavioural engineering implies that human lives must be controlled and shaped by external forces. Fogg's (2003) research into persuasiveness exemplifies how computers can influence people and persuade them to perform certain actions. This concept builds on Skinner's (1938/2006) earlier idea of operant conditioning, which laid the groundwork for the development of persuasive technology. For example, Skinner conducted an experiment in which he put a rat into a box where it could activate a lever to get food. After the rat learned how to get food, it only pushed the lever when it was hungry. Skinner, however, wanted the rat to push the lever again and again even if it was not hungry in an attempt to create addiction. This idea is not foreign to anyone who has used social media applications, where the user is constantly reminded to read or post something.¹² Fogg's persuasive technology is the prolongation of Skinner's behavioural engineering, building on the progress made by computers, as an important step in the technology of control.¹³

This issue is examined through the debate between Burgess and Skinner, where contrasting views on behavioural control and individual agency reveal the deeper tensions between conditioning and free will. On one hand, Burgess (1990) follows a Christian morality, where human freedom is at the centre. His book is a demonstration of the infringement of these liberties, but he doesn't propose any alternative to the issue of youth delinquency. Skinner (1971/2002), on the other hand, has an elaborate plan. It necessitates a belief that 'freedom, dignity, and value are major issues, and unfortunately they become more crucial as the power of a technology of behaviour becomes more nearly commensurate with the problems to be solved' (p. 27). However, Skinner tends to rationalise the individual to build a society that limits freedom. It is a performative model of humanity that aligns with his perspective but lacks empirical data. To illustrate his theory, he develops this idea in the novel *Walden II*, depicting a community that operates solely through behavioural determinism.¹⁴ The use of a story to express his social utopia is the mirror of Burgess's technological dystopia. Their stories are told from two contrasting

¹² See Lindström et al. (2021) for further research.

¹³ See Watters (2021) for further research.

¹⁴ *Walden II* was written in 1948, before ACO, and republished in 1976 with an addendum in which he revisits his ideas 28 years later.

perspectives: one from above, reflecting Skinner's notion of control, and the other from below, embodying Burgess's concept of freedom.

While Burgess's work remains within the realm of fiction, Skinner's vision of a social utopia found real-world application, revealing not only its potential successes but also its inherent limitations in practice. *Living Walden II* recounts the implementation of Skinner's ideas in the 1960s and 1970s. Hilke Kuhlmann notes that 'Skinner has always been impatient with those who demanded to know what the social purpose or goal of his utopia is. To him, the goals of any perfected society are self-evident—better health, better education, greater knowledge, more fulfilling work and leisure, harmonious relationships' (Kuhlmann, 2005). These are the terms in which Skinner thought about solving the issues of society, and these are difficult to contradict. However, this represents an atomistic perspective of society, where addressing collective issues comes at the expense of individual needs. Skinner's notion of a 'harmonious relationship' seems to be a predetermined conclusion, as it is not deeply examined or reflected upon. Kumar (1991) explains: 'Assuming a consensus about the nature of the good life, Skinner is concerned with means, not ends' (p.349). A society of means and no ends is not a utopia, but a technocracy, a society of experts. If Skinner's Walden project was infused with technology, it would resemble the society depicted in ACO, where technology is purely instrumental, with little regard for its negative consequences on individuals.

The notion that individuals require control stems from their perception as machines, entities that can be programmed, regulated, and optimised, thereby justifying external mechanisms of control. The nineteenth-century philosopher John Stuart Mill argues that 'human nature is not a machine built after a model' (Mill & Robson, 1977, p. 262). This is an early reference to the concept of mechanical humanity that I use throughout. Instead, Mill suggests that humans are like a tree 'which requires to grow and develop itself on all sides, according to the tendency of the inward forces which make it a living thing' (p.262). Mark Coeckelbergh (2021) presents this contradictory notion of freedom by framing it in terms of positive and negative freedom. Negative freedom focuses on constraints (behavioural and persuasive) while positive freedom focuses on the 'freedom to', such as governance and self-mastery. ACO puts this idea to the test. In the scene where the result of the Ludovico Treatment is tested, the priest stands as the only critical voice in the audience, exclaiming: '*Choice!*'. He continues:

‘The boy has no real choice, has he? Self-interest, the fear of the physical pain drove him to that grotesque act of self-abasement. He ceases to be a wrongdoer, he ceases also to be a creature of moral choices’ (Reel 10, Scene 42).

To which the Minister who ordered the experiments responds:

‘We are not concerned with motives, with the higher ethics. We are concerned only with cutting down the crime and relieving the ghastly congestion in our prisons’ (Reel 10, Scene 42).

The film oscillates between two moralities, the libertarian perspective embodied by the character of Alex, and the authoritarian stance represented by the fictional government.¹⁵ This is a common opposition between the individual and the collective. Indeed, the government in the film operates from a utilitarian morality, employing the Ludovico Treatment to maximize utility, focusing on the ends rather than the means. However, Latour and Timothy Lenton (2019) reopen the debate on individual freedom under the ‘new climatic regime’ as an attempt to move the issue from the individual to the collective. They seek an opportunity to revise the relationship between human freedom and nature: ‘It is the Earth that now has to be “protected at all costs” against the encroaching of human (dis)order and (de)regulation’ (p.19). To the authors, the domain of necessity, such as nature, is different from the domain of freedom, such as politics and morality. I find Latour and Lenton’s revision particularly pertinent to the role of intelligent technologies in society. Acknowledging that objects, including technological ones, are part of society represents a step towards comprehending their role in the collective, encompassing both human and non-human entities. This acknowledgment contrasts with their utilitarian role, as exemplified in instances such as the Ludovico Treatment or within industrial contexts, where objects serve to maintain a capitalist function.

This discussion allows me to reflect on the concept of relatedness by focusing on the opposition of free will and behavioural engineering. Relatedness is neither free will (Burgess, 1990) nor control (Skinner, 1971/2002; Fogg, 2003) but the current climate crisis makes it necessary to think in terms of reconciling the individual and the collective. To create an alternance between positive and negative freedom (Coeckelbergh, 2021), towards

¹⁵ See Rabinovitz (1979) for further research.

the domain of ecological necessity (Latour & Lenton, 2019),¹⁶ technological development needs to help the user make their choice in relation to the broader consequences.¹⁷ The question of who is in charge is not yet resolved, but the direction is clear. The next section refocuses attention on the objects, the props, and seeks alternative theories through this new philosophical framing.

6.2 Speculative Affiliation: In Search of the Good Society

The affiliation of the prop deepens the analysis by comparing it with other enacted technologies that address similar issues. As a key component of the translation method, it situates the performativity of the object within a broader social context and enables a critical examination of how these technologies reconfigure the conditions of imprisonment to show the increasing instrumentalisation of the institution and how it shapes the development of technology. I draw on examples from the carceral system as reimagined through the science fiction television series *Star Trek* (Roddenberry, 1968–1969), *Black Mirror* (Brooker & Tibbets, 2014) and *Altered Carbon* (Kalogridis, 2018–2020). In the discussion, I examine the possibility of going beyond the instrumentalisation of technology, firstly by examining the issue of control in carceral systems through the lens of critical criminology, then by exploring some alternatives through MacIntyre's opposition between external control with internal growth (1981/2007).

6.2.1 Reconfiguring Prisons through Science Fiction

Do you want a simulated body?

Mathew, *Black Mirror*

The Ludovico Treatment provides insight into the challenges faced by the carceral system, particularly in relation to the imprisonment of young offenders. While the treatment addresses a legitimate issue, it simultaneously reveals the limitations of a social model that prioritises individual over relational solutions. ACO is set in a dystopian society, but presents a punishment based on reformatory theory, employing a rehabilitative process. From this perspective, it is a positive development, offering an alternative to prison as

¹⁶ Ecology is defined here as the relation with nature, so the domain of ecological necessity is the requirement to find a relation with nature.

¹⁷ I am aware that this statement is very naïve considering the crisis of trust in politics and science and the role of the internet in providing quick access to solutions. It is an issue encapsulated by Latour's notion of 'double click' (Latour, 2005c).

retributive system. However, Burgess (1990) uses the story to denounce this form of rehabilitation, suggesting instead that Alex is not entirely free, as his free will is re-programmed. Other science fiction films and TV series extend the trajectory established by ACO, widening the gap between mind and body by depicting increasingly powerful technologies.

Figure 6.14 and Figure 6.15

The chair in the Star Trek Episode the Dagger of the Mind.



Note: [Film Stills]. McEveety, V. (Director), Wincelberg, S. (Writer). (1966, November 3). Dagger of the Mind [Season 1/Episode 9]. In Roddenberry, G. (Creator). *Star Trek*, Desilu Production, Norway Production, Paramount Television.

In the TV Series *Star Trek* (Roddenberry, 1968–1969) the depiction of prison presents a paradox, as it strives to reflect a utopian vision of justice while simultaneously exposing the dystopian realities of carceral systems. This series consistently portrays an optimistic vision of the future of technology, economy, and politics (Saadia, 2016), using the concept of the Federation¹⁸ as a framework for addressing societal challenges. This offers a valuable opportunity for new proposals. However, enemies and traitors persist, and the series fails to present any meaningful alternatives for the future of the carceral system. This shows how deeply the idea of prison is ingrained in society. Prisons are often depicted in a way that illustrates the negative qualities of others, such as the Klingons, the eternal enemy of the Federation. However, an exception appears in the episode *The Dagger of the Mind* (1969), in which a Federation penitentiary is depicted. The Tantalus Penal Colony uses a neural conditioning device to control the inmates. While the technology is more advanced, the chair and the treatment (Figure 6.14, Figure 6.15) are very similar to the Ludovico

¹⁸ A definition of the Federation is given in one episode: ‘the Federation consists of over one hundred and fifty different worlds who have agreed to share their knowledge and resources in peaceful cooperation’ (Berman et al., 1995-2001).

Treatment. This demonstrates that, despite a much-improved society, torture has not disappeared. Compared to ACO, the only improvement is the chair's ability to influence the patient without any mechanical parts. This creates uncertainty for the witness, as they are unable to discern what produces such a powerful effect (Figure 6.15).

In the TV series *Altered Carbon* (Kalogridis, 2018-2020), humanity is reinvented as two separable entities with the body and the consciousness rendered apart through the 'stack'. This radical distinction transforms incarceration itself, as punishment shifts from imprisoning the body to confining only the consciousness, raising profound ethical questions. The first episode shows the character Takeshi Kovaks waking up, asking for a mirror and seeing a person he doesn't recognise. His body has either been resold, re-used or left to rot while he has been away for nearly 200 years. The punishment extends beyond the physical body, severing all social ties. It not only removes friends and family but also functions as a psychological punishment, where financial status determines which body, referred to as a 'sleeve', is inherited.¹⁹ The shock would be enormous. Since the consciousness is accessible by computer, the stack in the prison is made accessible to torture the inmates, reminding them of their crimes on a loop. Control of the mind is the ultimate control, as it can simulate any type of torture. Despite the technological progress, compared to the Ludovico Treatment, it employs a similar approach, reconfiguring the brain while eliminating the necessity of the body. However, once a person is free in *Altered Carbon*, the mind is free too, and only the body is a reminder of the person left behind.

The episode of the TV series *Black Mirror* called *White Christmas* (Brooker & Tibbets, 2014) is another story of dissociation between the body and the consciousness. Mathew works for a company called Smartintelligence which makes blank 'cookies' which can be surgically implanted into the brain to shadow the mind of the host. The intention is to learn the habits of the host in order to create a perfect copy. The cookie is an exact replica of the host except that it lives in a prison of its own making and is offered the choice to either serve or do nothing.²⁰ The instrumentalisation of the self appears to be the

¹⁹ Only the very rich have the ability to make copies of their original body. Those without means are supplied other bodies, hence they do not look the same afterwards.

²⁰ There is a connection with ACO through the music. When the cookie finally agrees to obey, the director chooses Rossini's 'Thieving Magpie' which is also in ACO. Kubrick says: 'The first section of the film that incorporates most of the violent action is principally organised around the Overture to Rossini's Thieving Magpie, and, in a very broad sense, you could say that the violence is turned into dance, although, of course, it is in no way any kind of formal dance' (Houston, 1971).

ultimate convenience, eliminating the need to train a machine by making the machine an integrated part of the subject. The mechanisation is extreme, as the cookie is forced to live as a slave for the rest of its life. At the end of the episode, Mathew is discovered to be a criminal, and his punishment involves a technology attached to everybody's eyes at birth, the Z-Eyes. The police put him on a register, similar to electronic monitoring, which means he is blocked from the sight of others. He becomes an anonymous shape and, while he keeps his freedom and does not occupy a space in prison, everyone in society knows he is a criminal.

The analysis of these cases in science fiction demonstrates that a future of reclusion through technology thrives on widening the gap between the body and the mind. This dichotomy is a recurring paradigm in the application of advanced technology, one that supports the atomisation of society, where the individual is considered in isolation from their context.²¹ For example, the Ludovico Treatment focuses solely on altering the minds of individuals, without addressing the structural causes of youth delinquency. While ACO shows a case where the body is used to remind the individual of the rules of society, *Altered Carbon* takes this concept further by discarding the body entirely, allowing rehabilitation to extend beyond the lifespan of the physical form. In *Black Mirror*, the Z-Eyes technology acts as an interface between the mind and the environment, enabling society to cast a person out while allowing them to maintain a semblance of freedom. In *Altered Carbon* and *Black Mirror*, the consequences of punishment reduce the need for prisons by minimising spatial requirements or restricting interaction with others. Viewed as a cosmogram, the technology offers a new solution but fails further to address the inherent contradiction through technology. Ultimately, the enacted technologies do not advance the resolution of the issues at hand but rather highlight the severity of the problems inherent in the current model of instrumentalisation.

6.2.2 Discussion: Technology beyond Instrumentalisation?

The enacted technologies presented in the affiliation reinforce the reductive notion that technology's value resides exclusively in its instrumentalisation. This notion is so deeply ingrained in our society that it extends from everyday conveniences to institutional

²¹ Early AI researchers were keen to keep this simple vision as a model. It is influenced by the philosophy of René Descartes and has been critiqued by Hubert Dreyfus who promotes the application of more recent philosophical knowledge such as phenomenology (Dreyfus, 1992).

demands for efficient solutions.²² However, addressing significant societal challenges requires a more comprehensive approach, one that critically examines both sides of the cosmogram to fully understand the consequences of technological use. This is evident in carceral systems, where the use of technology often serves to shift responsibility onto the individual rather than challenging institutional or societal structures. In this section, I propose a pluralistic approach to technology that challenges the dominance of instrumentalisation. To formulate this new perspective, I draw on critical criminology's alternative viewpoints and revisit MacIntyre's concepts of internal and external goods (2007) to formulate a new perspective.

Figure 6.16

Stanley Kubrick and Malcolm MacDowell sitting in the Ludovico Clinique



Note. [Photograph]. (1972). Courtesy of The Stanley Kubrick Archive (SK/13/9/1/1). Archives and Special Collections Centre, University of the Arts London, United Kingdom.

The Ludovico Treatment reflects the society of its time, while seemingly offering an alternative to imprisonment by using control as a means of reformation. However, doing so shifts the focus from the institutional or societal issue to the individual (Figure 6.16). At the time of the making of ACO, there was 'a fear of the authoritarian potential of government and of science' (Garland, 2001, p.57) which justifies the response of Burgess. The film came out at a key moment in the transformation of prisons: 'The theories that now official thinking and action are *control theories* of various kinds that deem crime and delinquency to

²² Elisabeth Shove claims that convenience is a 'human need to be met, and the task of science and engineering is to specify and deliver the required conditions' (2003, p.41).

be problems [...] of inadequate controls. Social controls, situational controls, self-controls—these are the dominant themes of contemporary criminology’ (Garland, 2001, p.4). Any institution that had plans for reformatory action had been reduced to an instrument of retributive punishment. According to Garland (2001): ‘Control theories begin from a much darker vision of the human condition. They assume that individuals will be strongly attracted to self-serving, anti-social, and criminal conduct unless inhibited doing so by robust and effective controls’ (p.15). As demonstrated here, control theories focus onto the individual’s behaviour rather than addressing broader societal issues as it aligns with an efficiency perspective.

Critical criminology challenges the instrumentalisation of correctional institutions by engaging with the broader social context of crime. While correctionalism embodies the utilitarian aspect of discipline, demonstrating how instrumentalism can be applied to an entire institution, critical criminologists contend that establishing ‘a better politics of crime’ (Loader and Sparks, 2012, p.14) should precede the implementation of a carceral system as the unique solution. According to Malloch and Munro (2013), the heart of the classical approach lies an implicit vision of a ‘good society’, while the critical view presents the need for ‘a better politics of crime and its control [...] under which a more hopeful and more richly democratic way of approaching questions of crime and justice might be developed’ (Loader and Sparks, 2012, p.14). The concept of ‘good society’ that is criticised here is one centred on order, where the instrumentalisation of technology is employed to maintain or resolve societal issues. However, other approaches are possible. Coeckelbergh (2021), for example, states that ‘politics should be aimed at the good life and also the common good’ (p.43). Rather than merely striving for the appearance of a well-tuned society (the good society), the focus should encompass development and inclusivity (the common good) and the fostering of meaningful relationships with others (the good life).

To challenge the dominance of instrumentalisation, I draw on MacIntyre’s theory (2007), which, like Burgess, rejects utilitarianism and seeks a more robust moral framework rooted in older philosophical traditions.²³ I compare MacIntyre and Skinner’s approaches

²³ Rubin Rabinivitz researches the ethical values of ACO and claims that Burgess was fascinated by the opposition between the Christian moralist Pelagius and St Augustine (1979). According to Rabinivitz, they represent the opposition between the libertarian and authoritarian perspectives presented in the film. In contrast, MacIntyre aligns himself towards another Christian figure, St. Thomas Aquinas (Knight & MacIntyre, 1998) who focuses on examining actions and questioning why an action is considered good (Lagerta, 2011).

to education. As a behaviourist, Skinner prioritises external control as a means of shaping behaviour. In contrast, MacIntyre advocates an educational model that balances external control with internal growth, emphasising the cultivation of virtue over mere conditioning.²⁴ According to Kuhlmann (2005), Skinner considers the educational system to be the real achievement of the Walden community: 'Children are kept in a completely controlled environment that is intended to weed out all behaviours considered unacceptable in utopia while fostering behaviours that make for self-confident, peaceful, happy, and productive members of society' (p.9). His goal is to reduce emotions such as jealousy: 'The world isn't ready for simple pacifism or Christian humility [...]. Before you can safely train out the destructive and wasteful emotions, you must make sure they're no longer needed' (p.10). In contrast, MacIntyre approaches education through a thought experiment. He suggests that teaching might begin by offering candy to play chess, and that might be enough to learn to win, in the hope that a child may come to appreciate the unique combination of skill and ability that chess requires (MacIntyre, 1981/2007). This resonates with many pragmatic philosophers, such as John Dewey (see Rosenbaum, 1998), as their focus is not on outside control but self-mastery. The originality of MacIntyre, however, lies in his use of external control (the candy) to initiate change, with the hope that the change will eventually lead to self-mastery. Compared to Skinner, his approach acknowledges the possibility of failure, that things might not always go as planned, but always seek internal improvement.

These approaches illustrate that instrumentalisation and relatedness can coexist in a pluralistic relationship with technology, where instrumentalisation may be necessary at times as long as the ultimate goal is encouraging self-reliance and reducing dependence. MacIntyre notes that it is not sufficient to motivate a child to learn to win, as this may involve cheating if the opportunity arises (MacIntyre, 1981/2007). He says that cheating to win is a form of losing, because the child is denying the true reward of playing, which is internal to the game. These internal and external components are central to MacIntyre.²⁵ This leads me to argue that that a technology as a control should only be considered as an

²⁴ In Skinner's view: 'The community's children undergo "ethical training" from age three to six. It is this training, teaching them self-control, perseverance, and tolerance for frustration, that enables them to go on to become good students, mature adults, and happy communards' (Kuhlmann, p.11).

²⁵ MacIntyre changes his terminology from 'internal goods' to 'goods of excellence' and 'external goods' to 'goods of effectiveness' (Knight, 1998, p.55). While I see the issue with the opposition between internal and external, it is clearer in my opinion, so I mix the old and new terminology.

initial phase. The internal, or 'goods of excellence', can only be achieved by participating in the practice itself, and the external, or 'goods of effectiveness', are attached to 'the accidents of social circumstance' (MacIntyre, 1981/2007). MacIntyre does not deny the use of a behavioural approach as long as it can help the user move from external motivation to internal motivation, from a mode of effectiveness to a mode of excellence. This is important in terms of relatedness, which should not be seen as a static mode in direct opposition to persuasiveness but as flexible system that allows the use of technology as an external support until the internal motivation becomes enough.

The objects of science fiction examined in the affiliation indicate the difficulty of creating an alternative to prison. This position is challenged by critical criminologists, who argue that establishing a societal model should precede the implementation of any carceral system. Therefore, to move beyond the instrumentalisation of technology, it is essential to go further than the simple model of 'a good society' (Loader & Sparks, 2012) and seek 'a good life and also the common good' (Coeckelbergh, 2021). To do so, MacIntyre (1981/2007) seeks a pluralistic model that acknowledges the necessity of some instrumentalisation by integrating the notion of the internal, practice, and the external, into the social circumstance. Instrumentalisation may be necessary but intelligent technologies should allow for a shift that enables users to grow independently.

6.3 Technological Relatedness through Control as Plurality

The final stage of the translation consists of composing the research findings into a new proposal for intelligent technologies. Using performativity as an analytical lens, the formation stage reveals issues inherent in the making of technology. Through its naming, the character provides durability, while the Ludovico Treatment, as a boundary object, creates permeability, between science and fiction. This generates problematic effects such as maintaining violence from the ideation to the distribution of the movie. The goal of the translation is therefore to be aware of the performativity of these enacted technologies and reconfigure them. To this end, I draw on the performative relationship with the Ludovico Treatment (RQ1), revealed as pain as a common, and on comparative analyses of other props in cinema (RQ2), to articulate the foundations of technological relatedness (RQ3) as a means of engaging with these tensions by problematising control in interaction design.

In the first part of this section, I demonstrate that technological relatedness is a mode of engagement with the collective through intelligent technology, grounded in an ongoing process that seeks symmetry across networks of relations. I focus on the issue of control as a plurality when dealing with crises such as youth delinquency or climate change, where the mediation of interaction is perceived through its role as a form of control. The initial process is revealed through performativity and shows the repetition of violence as a stabilised relational pattern. To move beyond this, I orient the composition towards the collective by drawing on Simondon's theory of transindividuality (1958/2017), using technology as a form of mediation. Specifically, I focus on the symmetry between the user and the system, as exemplified by the notion of pain as a common. I propose embracing the common as a method for modulating the agency of intelligent technologies when they are understood as part of a network of relations. The second part of the section discusses the broader implications of technological relatedness for interaction design by reframing the notion of control.

6.3.1 Control as a Process of Transindividuality

The relation of control is rarely addressed directly in interaction design, because the relationship between users and objects is often seen as an improvement due to the use of technology, regardless of the issue caused. By the phrase control through plurality, I refer to situations in which a collective crisis is used to justify technological interventions that constrain agency in the name of protection. For example, in ACO, youth delinquency is presented as a matter of public concern that authorities treat with urgency. This urgency creates the temptation to adopt technological interventions that promise quick and efficient solutions by modifying the body's response to violence. The Ludovico Treatment reveals the danger of this logic: rehabilitation becomes a form of biological reconfiguration in which technology intervenes directly in human agency.

Similar dynamics appear in other films where rehabilitation depends on a separation between mind and body, whether through the restriction of perception such as *Black Mirror* (Brooker & Tibbets, 2014) or the externalisation of memory such as *Altered Carbon* (Kalogridis, 2018-2020). Such interventions claim to act in the interest of the collective, yet they operate through asymmetrical relations that reduce freedom by altering human agency. Although they are presented as forms of care or rehabilitation, they often involve a permanent trade-off in which social order is preserved at the cost of diminished human capacities. Against this model, I conceptualise relatedness as a way of engaging

with the collective that fosters more symmetrical relations with technology while making networks of obligation and dependency visible. Control through plurality therefore becomes a site for examining how intelligent technologies can modulate our agency in times of adversity.

While the rehabilitation of Alex in the film may appear positive when it is framed as a contribution to the collective, its asymmetry impacts the freedom of the prisoner. Relatedness offers an alternative approach, structured around three key dimensions: process, symmetry, and network. Process refers to the dynamic through which the relationship between the user and the object is formed. In the analysis, the durability and boundary effect demonstrate the easy transmission of undesirable effects between actors.²⁶ Specifically, the Ludovico Treatment does not remain confined to the fictional world as it had unexpected effects on McDowell. It operates as a boundary object between medical fiction and medical reality. The network is revealed through the performative relationship, which I conceptualise as pain as a common. This concept is presented as a paradox: the common is not a product of sharing a positive resource, such as water, but the avoidance of a negative one, such as the pain experienced by the film actors. This original relationship opens the possibility of rethinking intelligent technology in more symmetrical terms. In the film, pain begins as something inflicted asymmetrically on Alex's body, yet it later circulates as a shared problem without much awareness from the film production.

Table 6.2

The character and the object of ACO in terms of process, symmetry and network

Process (across film and stage)	Symmetry (across film and stage)	Network (across film and stage)
Performativity through the durability and permeable boundary of the Ludovico Treatment	Pain as a common (it circulates)	Pain as a common (maintains a network)

Developing a solution requires an approach oriented towards transforming relationships, where technology can serve as a form of mediation. Simondon's theory of transindividuality articulates this type of relational model. To demonstrate this transformation, I start with the concept of control through necessity, as it is a particularly contested domain. As illustrated in ACO, control can be a necessity in contexts where the

²⁶ By actors, I refer both to social actors, such as Lynn Burgess, Anthony Burgess, and Stanley Kubrick and to the film actors and characters within the film itself.

user may need to be constrained in response to collective crises, such as climate change (see Latour & Lenton, 2019; Coeckelbergh, 2012). However, rather than framing freedom solely in terms of limitation, I draw on the theory of transindividuality to suggest that freedom is a process of co-individuation as a means of raising awareness across all actors involved, human and non-human alike. To move from necessity to plurality, I suggest a shift in co-individuation towards a symmetrical relation capable of maintaining the network. Drawing on Gilbert Simondon (1958/2017), transindividuality shifts the focus from the already constituted individual to the process of individuation. Simondon argues that being is never fully resolved into a single individual, it always retains a pre-individual reserve of potential. As an approach to technology through plurality, I suggest that the individual may attempt to resolve internal tensions through technology when required. Combining MacIntyre (1981/2007) and Simondon (1958/2017), both of whom emphasise cultivation over mere conditioning, the plural approach allows the ‘I’ to contribute to the ‘we’ when able, or to rely on technology to support this contribution when unable.

Figure 6.17

A smart textile that connects the body and an aquaponic system



Note. [Sketch]. Courtesy of Lyu, R. (2019). Bind Together [Unpublished master portfolio]. University of the Arts London.

To exemplify the concept of relatedness through plurality, I draw on a project by an interaction designer who has been researching the relation between nature and acupuncture. In ‘Bind Together’ (2018), Ruizheng Lyu researches a training centre for

aquaponics systems in South London. In brief, aquaponics is a food production system that integrates aquaculture and hydroponics, whereby nutrient-rich water derived from fish waste is used to sustain plant growth. This emerging practice reflects a growing interest in alternative feeding systems and offers an intriguing way to reconsider our relationship with nature. Lyu analyses issues with the system, such as a lack of water circulation, poor water quality, insufficient light, and overpopulation of fish. Her solution is to use sensors and artificial intelligence to monitor whether the process requires upkeep.²⁷ However, rather than using a monitoring device placed near the aquaponic system, the author designs a bracelet that translates these issues into signals that are experienced by the human body (Figure 6.17). The project is useful because it does not eliminate control altogether, but this obligation is not imposed as behavioural correction. It emerges from the condition of interdependence between fish, plants, water, and human care. The aim of the project is to translate these issues into signals that the body can perceive, highlighting the systemic resemblance between the symbiotic relationship of fish and plants and our body.

Table 6.3

A smart textile that connects the body and an aquaponic system in terms of process, symmetry and network

Process	Symmetry	Network
Co-individuation between human and non-human entity	The bracelet enables communication from an element of nature when it is in difficulty (pain as a common)	The bracelet maintains the common through a network between a human and non-human entity

The project is not yet fully resolved but already offers a compelling vision in terms of process, symmetry, and network. Firstly, the process demonstrates the possibility of using technology as an agent of co-individuation between human and non-human entities. The human is encouraged to care for the system as if it were an extension of their own body rather than an external object. Secondly, the bracelet enables symmetry with the system by translating the issues encountered within it into bodily signals experienced by the user. The transfer of signals from the aquaculture to the human is unique in the sense that it can affect the human's health. The boundary is permeable in only one direction, as the signal is transmitted to the user but not back to the system. In this case, this asymmetry is justified because the aim is to communicate the needs of a plant, rather than to instrumentalise the

²⁷ This concept, known as mutualistic care, is introduced through the biodesign framework of 'living artefacts', which emphasises the reciprocal and evolving nature of care between humans and living organisms within artefacts (Karana et al., 2020).

plant as another monitoring device. The project deliberately stages an ethical tension: the signal is not merely informational but bodily. This raises questions about the limits of technological mediation, especially when care for a non-human system is translated into a physiological response which might lead to discomfort. However, unlike Pyle and his rifle, the aim is not to desensitise the user, but to produce sensitivity to a fragile ecological relation. Therefore, the symmetry is plural, meaning it only acts when the user decides to wear the bracelet. Further study is needed to visualise what is transmitted, particularly when the user seeks more detailed information. Thirdly, the project is based on the presence of two existing networks, a human network which seeks to produce and maintain knowledge about alternative food systems, and a non-human network in which fish and plants operate in symbiosis. These networks are clearly presented and generate what can be described as a pain as a common when disruptions occur. The role of technology is to modulate these disturbances into another network, the human body, understood here through a network of meridians, such as presented by acupuncture.

In cases where control becomes a necessity within interaction, it is not simply a matter of moulding the user to the needs of society, as demonstrated in ACO. Instead, technological relatedness demonstrates the possibility of using technology as modulation, which is here expressed through plurality. Moving the user from their position of convenience to a collective relation with nature requires an agreement with the user, of course, but the process should let the user choose between a directive approach, where control is occasionally maintained, and a softer approach, where the user develops their own sense of self-mastery (MacIntyre, 1981/2007). Technological relatedness provides a framework for engaging with the increased obligations that emerge from our fractured relationship with nature. In this relation, monitoring nature should therefore move beyond the transmission of data. Data may inform the user, but does not necessarily transform the user's relation to the system. Relatedness instead seeks to bridge systems by making ecological disturbance perceptible.

6.3.2 Discussion: Reframing Control as Plurality in Interaction Design through Technological Relatedness

There exists a solidarity among men as human beings that makes each co-responsible for every wrong and every injustice in the world, especially for crimes committed in his presence or with his knowledge. If I fail to do whatever I can to prevent them, I too am guilty — Karl Jaspers (1965).

Intelligent technologies are commonly framed as technologies of convenience, designed to simplify everyday life. Yet, more often than not, they also participate in processes of nudging and control, shaping the behaviour of the very subjects they claim to support. Through the concept of technological relatedness, I explore their potential as technologies, the significance of which lies in the relations they create, sustain, or transform within society. I draw on Latour (1987), who mentions the role of the object not as a means or an end but as a chain linking humans, and necessary for binding society. Graham Hartman (2009) paraphrases Latour, suggesting that ‘human society is in no way made solely or even principally of people, but requires fences, coins, uniforms, monuments, ships, flags, wedding rings, and highways in order to stabilise itself’ (p.21). The reason intelligent technologies are not mentioned in this list is that technology is inherently ambiguous. Its instrumentalisation is often invisible, and the convenience it offers frequently aligns it with industrial interests, undermining its potential to serve the broader benefit of society and raising critical questions about its ethical and communal implications.

Interaction design has historically been concerned with making technologies usable, efficient, intuitive, and responsive to users’ needs. As a result, control is rarely addressed as an issue. The critical design studio, Superflux, has made a video that offers a useful counter-example. *Uninvited Guests* (2015) is presented in the style of speculative design. The project does not propose smart objects as functional solutions but uses them to provoke debate about the social and political implications of technology. In the film, an elderly man is given a series of smart objects by his son, who uses them to encourage him to eat certain foods and walk a prescribed number of steps each day. At first, this appears to be a convenient and caring form of technological assistance. However, Superflux quickly problematises this relation by showing how the elderly man hacks the system in order to avoid submitting to the objects’ instructions. Rather than celebrating usability or intuitive interaction, *Uninvited Guests* (2015) stages a refusal of technological control. The man’s resistance reveals that these smart objects do not merely support care; they impose behavioural norms and transform care into a form of surveillance and discipline.

In interaction design, control is not only a matter of the user’s actions, but also of the relations established between the user, the technology, and the surrounding environment. Within the framework of process, symmetry, and network, the network is the key component because it reveals the provenance, circulation, and distribution of power. To examine this, I draw on the controversy around the Leviathan. Originating in Thomas Hobbes’s political theory (2010), this refers to the necessity of a central authority capable of

maintaining the social order. Although often interpreted in authoritarian terms (Newey, 2008), the concept is valuable in that it raises broader questions about the relationship between individuals and institutions. This is particularly relevant in times of crisis, such as climate change or COVID-19, as it underscores the role of governments in taking decisive, and sometimes restrictive, measures. Callon & Latour (2014), as well as Coeckelbergh (2021), propose ways to reinterpret this concept, which can be understood as a form of *democratic Leviathan*. Both emphasise the importance of the social contract underlying the Leviathan, suggesting that, while decisions may be coercive, authority is nonetheless grounded in collective agreement. Their positions diverge, however, in how this contract is conceived. Latour questions its stability and legitimacy, whereas Coeckelbergh is more inclined to engage with and reinterpret it for contemporary contexts.

A democratic Leviathan lets us face reality beyond the opposition between freedom and control but requires translation into practical terms. Through transindividuality, I show that the individual is too often framed as the problem, as discussed in the previous chapter. In contrast, the Leviathan foregrounds the necessity of trust between individuals and institutions. Callon & Latour (2014) suggest replacing the idea of a fixed social contract with ongoing processes of negotiation, rather than relying on the occasional vote, they suggest finding ways to participate more regularly.²⁸ At the same time, Callon & Latour (2014) emphasise the role of durable materials in stabilising these relations, such as contracts, laws, walls, and technical infrastructure. Both perspectives open up possibilities for intelligent technologies, either as participatory tools that support continuous negotiation, or as infrastructures that reinforce durability. Coeckelbergh (2021) also argues for the use of AI in this context, however, his approach often unfortunately relies on nudging users, which risks reintroducing asymmetrical relations rather than fostering genuine participation.

To offer this new perspective on the role of technology in society, I draw on Latour's (2010) understanding of nature as something to be made, composed, and negotiated, rather than a passive backdrop for human activity. A similar approach can be extended to technology, the development and use of which should be carefully composed to benefit both humans and the environment. In this view, technology is not merely a means to an

²⁸ The United Nations Development Program uses, for example, the concept of collective intelligence. This concept is limited, however, as it only uses technology 'to mobilize a wider range of information, ideas and insights' (Peach et al., 2021, p.4).

end. When treated instrumentally, it risks detaching action from intention, leading the inventor to forget the reasons underlying what he creates (Tassinari & Staszowski, 2020, p.4). By considering the network an essential component in situations of crisis, I suggest that technology can act as a third force, as argued in Chapter 5. However, this force must be localised within neighbourhoods or villages, where power remains accessible and can be challenged rather than invisible. Lyu, therefore, proposes a wearable object that helps maintain the network in a plural manner. Its smart feature occasionally informs the user about what is happening and whether intervention is required. In this instance, the network is not predetermined or imposed but actively chosen by the user. Composing technology thus becomes a necessary step in moving beyond instrumentalisation, as it requires careful deliberation, balance, and a conscious effort to resist the allure of technical sweetness.

An example of this approach can be found in the concept of pain as a common. In the epigraph above, Karl Jaspers (1965) argues that every injustice in the world is shared among all people. While this statement addresses responsibility in the context of the Second World War, it highlights how society is shaped through collective action. Pain as a common extends this idea by suggesting that such a condition is not natural but must be cultivated through discipline. I suggest that this process can involve a degree of delegation to technology, while ultimately seeking to enable individuals to develop their own sense of responsibility in relation to the environment. From this perspective, a plural approach to technology implies that it should operate through modulation rather than imposition. In times of necessity, such as climate change or COVID-19, reliance on a Leviathan model of centralised authority proves insufficient, as it often triggers resistance. The reaction of the elderly in the opening example reflects this refusal of imposed authority, particularly when mediated through machines.

Relatedness requires thinking in terms of process, symmetry, and network. The process can be understood through transindividuality, where attention shifts from individuals to intermediaries allowing the collective to be informed through shared conditions rather than individual surveillance. Symmetry implies that obligations are not imposed indefinitely, but demonstrated as beneficial to collective living, allowing responsibility to emerge internally over time, in line with MacIntyre's notion of the development of virtue. Finally, the network concerns the location of the collective itself, which should be made visible to users, enabling them to situate their actions within a shared context. In contrast to top-down impositions of constraint, authorised by

institutions, this approach seeks to establish a common that emerges from everyday practices, engaging individuals in the ongoing negotiation of collective life.

6.4 Summary

In the second case study, I examine technological relatedness through the lens of control as plurality. In the context of crisis, such as climate change, freedom may be curtailed in the name of the collective good. My aim is to develop a new approach to intelligent technologies in which relations are composed beyond the modernist framework of instrumentalisation. To this end, I foreground plurality as a technological approach that emphasises the cultivation of virtue over mere conditioning (MacIntyre, 1981/2007). The formation is examined through two concepts in STS: durability and the boundary. The naming of the character, Alex, indicates the durability of the violent act against the Burgess family and the author's attempt to preserve its significance. This fragile boundary between reality and fiction is also present in the prop, which represents governmental violence but also enables violence against the actor. I therefore conceive the prop as a boundary between medical fiction and reality. The performative relationship (RQ1) emerges through the pain inflicted on many people, across multiple planes, from the historical plane (an attack), to the story plane (an attack), the performance (the pain is acted out by the actor), and, surprisingly, crosses over to the stage when an actress and the main actor were hurt during the shoot. I identify the performative relationship as a pain as a common, where the pain transmits through a variety of objects such as the novel, the film, and the Ludovico Treatment. In the first discussion, I examine the opposition of free will and behavioural engineering. The current ecological crisis makes it necessary to think in terms of reconciling the individual and the collective and creating an alternance between these, through positive and negative freedom (Coeckelbergh, 2012), towards the domain of ecological necessity (Latour & Lenton, 2019). For such a shift to take place, technological development must be reoriented toward negotiation.

Through the speculative affiliation (RQ2), I examine the key social issue that the enacted prop performs in the film, and whether this issue is addressed or resolved by other props in other films. This is particularly evident in prisons, where instrumentalism tends to be the dominant logic. A neural conditioning device in *Star Trek* (Roddenberry, 1969), which closely resembles the Ludovico Treatment, exemplifies the recurring paradigm. Other speculative interventions promote a model in which the person continues to function within society while simultaneously enforcing isolation through sensory reduction. In the

discussion, I address the issue of techno-solutionism through the lens of critical criminology, arguing that the goal of building a 'good life and a common good' (Coeckelbergh, 2021) should take precedence over maintaining a good society. Drawing on MacIntyre (2007), intelligent technologies should be configured to adopt a pluralistic approach. While some instrumentalisation may be necessary, it needs to be temporary, allowing for a shift that enables users to grow independently.

Finally, I develop the concept of technological relatedness (RQ3) as the possibility of using intelligent technologies as modulation, expressed here through plurality. Moving the user from a position of convenience towards a collective relation with nature requires agreement with the user, but the process should allow them to choose between a directive approach, where control is temporarily maintained, and a softer approach, where they develop their own sense of self-mastery (MacIntyre, 1981/2007). I illustrate this through an aquaponic system that foregrounds our relationship with nature. This challenges simplistic models of the individual and society by acknowledging the ethical and ecological stakes of technological development.

Chapter Seven

Dr Strangelove's Glove: Technological Relatedness through Instauration

Note. [Photograph]. Peter Sellers and his Glove (Standing) and Stanley Kubrick (Sitting) on the Set of *Dr. Strangelove*. Copyright MPTV images.

In this third case study, I examine the concept of relatedness through the lens of instauration. The conventional view treats intelligent technologies as asymmetrical instruments: they serve human needs, but are not considered capable of shaping, provoking, or mediating thought. Instead, I argue that a symmetrical relation with technology unfolds through a process of instauration (Souriau, 1943/2015), in which both object and subject are co-constituted. Applied to intelligent technologies, this means that both the individual and the technology are understood as unfinished and in the process of becoming. When the social is considered, relations between individuals are not organised hierarchically but unfold laterally, from one individual to another. Examined through Simondon's theory of transindividuality (1958/2017), I conceptualise intelligent technologies as relays that connect individuals in their ongoing processes of individuation, through the instauration with technology, contributing to the formation of collective habits. From this perspective, I argue for forms of technology that foster responsible relationships with the collective, extending beyond the human to include non-human entities. The film *Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb* (Kubrick, 1964) (hereafter *Dr. Strangelove*) provides a compelling example, in which a mechanical glove temporarily takes control of the character, exposing and condemning his destructive impulses. This scene illustrates the potential of technology to intervene in individual agency and reorient it in relation to the collective.

The prop, a glove, is examined for its situated qualities. As a situated object, I examine the relation between the performance prop and the enacted technology and how the prop on stage helps the actor figure the character in the film. As an enacted technology, I interpret the glove as a device that exposes the user, serving as a warning to those around him by revealing his nefarious ideology. The analysis begins by locating the black box, the motivations behind selecting and investigating Dr Strangelove's glove. In this instance, the character's responsibility is to advise and mitigate the repercussions of a nuclear attack. He performs his duties well until his original Nazi ideology begins to resurface. As he attempts to conceal this alignment, his arm suddenly takes control of his action and exposes him to his colleagues by giving a Nazi salute. This gesture has received many interpretations, and my belief is that it originated from the relationship between the actor, Peter Sellers, and the glove which was given to him just before he started playing Dr Strangelove. In my interpretation, the actor faced significant challenges in synthesising the multiple historical characters who inspired the character. However, upon discovering the glove, everything aligned cohesively. Therefore, the glove is examined as a performance

prop for its ability to assist the actor on set, but also as enacted technology that demonstrates an autonomous agency of the character's arm in the presence of the people he advises. Thus, I argue that the transindividual nature of the technology is demonstrated in the film but also takes root on stage, where the actor's interpretation and use of the prop synthesize a complex character.

This chapter aims to demonstrate the potential of instauration in the context of intelligent technologies. The initial step involves examining the character and the prop development to identify the particular elements that contribute to the nature of their relation (Section 7.1.1 and Section 7.1.2). At first, the director and the actor describe the glove creatively (Section 7.1.3) as a solution. However, I argue that the performative relationship (RQI) emerges between the actor and the glove during improvisation, through a process of instauration (Souriau, 1943/2015), demonstrating new possibilities for considering a symmetrical relation with technology. In the first discussion, this symmetrical relation is further examined through the concept of the event (Gomart & Hennion, 1999), challenging the notion of scripting developed thus far (Akrich, 1992) (Section 7.1.4). Through the speculative affiliation of the object, the focus shifts to the relationship between the intertextual and performance planes. I examine other symmetrical relations between human and fictional gloves through the analysis of props such as *Dr. No* (Young, 1962) and *Metropolis* (Lang, 1927), which similarly deploy technological gloves to explore the mediation between human agency and technological intervention (see Section 7.2.1). Following this, I propose a new interpretation of Dr. Strangelove's glove as a mechanical prosthetic, in which its memory functions as the agent of instauration (Section 7.2.3). In the section on relatedness, I take the performative relationship from the stage to explore the transindividuality through the technological object. I argue that the glove presents the ability to create a particular link as it takes over the owner to socially denounce him (Section 7.3.1). I discuss the use of animism as a conceptual tool in interaction design and draw on Philippe Descola's modes of relation to further the development of intelligent objects (Section 7.3.2). In the last section,

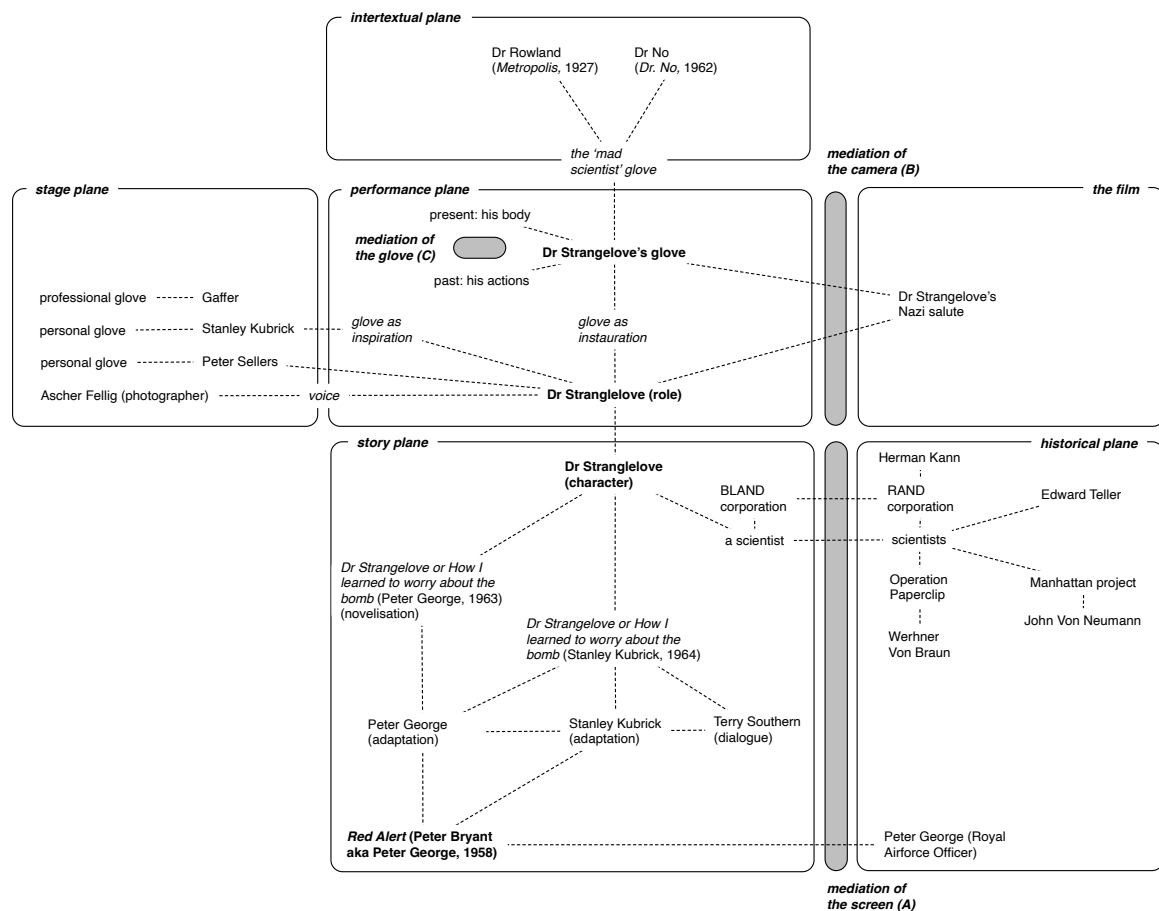
As sources, I use the Stanley Kubrick Archive (SKA), the novel *Red Alert* (1958)¹, the post novelisation *Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb* (1963)

¹ Published in the UK as *Two Hours to Doom* under the pseudonym Peter Bryant, whose real name is Peter George.

by Peter George, the film itself, and the many visual and written references on the movie.

Figure 7.1

The section narrative shows the planes that contribute to the mediation of Dr Strangelove and his glove.



7.1 Formation: 'Dr Strangelove' and his Glove

The fictional relationship between Dr Strangelove and his glove is assumed to be a normal until it takes an unexpected turn when Dr Strangelove is possessed by his arm and does a Nazi salute. This action, although satirical in the context of the film, allows an exploration of the concept of instauration through the use of a prop. While the key event unfolds on screen, my analysis centres on the development of the character and the performance on the stage, as it offers valuable insights into the development of the prop that I extend to intelligent technology through translation. Firstly, I examine the individuation of the character, through an analysis of the development of Dr Strangelove as a co-production shaped by multiple historical influences that inform his identity, actions, and thoughts. Secondly, I examine the influence of the prop as a key element of the individuation of the actor. The prop helps the actor navigate and choose among the multiple voices that complicate his interpretation of the character. Thirdly, I identify the performative

relationship is established through a process called instauration, in which the glove gives new possibilities to the interpretation of intelligent technologies.

The section narrative of *Dr. Strangelove* provides the elements to build an alternative narrative focusing on the mediation of the glove (Figure 7.1). In this case, the main focus is on the relationship between the story plane and the historical plane, and how this interaction impacts the performance plane (Section 7.1.1 and Section 7.1.2). This highlights the use of a prop as a solution, shaping the relationship between the actor and his performance during the development of Dr Strangelove's character.

The sources for the formation come from the development of the script from the SKA (such as SK/II/1/16, SK/II/1/3, SK/II/1/1) which provides insights into the characterisation of Dr Strangelove. The analysis brings much ambiguity about the origin of the character as found in various scholarly sources (Frayling, 2005; Case, 2014; Kramer, 2014), an interview with Peter Sellers on *The Steve Allen Show* (1964) and the novelisation of the film from the original author (Georges, 2015) which includes more stories about Dr Strangelove. The analysis of the glove is manifest through its absence from the SKA (such as SK/II/2/8, SK/II/3/4, SK/II/10/1/4, SK/II/3/8). Instead, I examine the controversy between the biographers of Kubrick (Walker, 1971) and Sellers (Sikov, 2003). The performative relationship is established through the analysis between pre-shooting script (SK/II/23) and the post-shooting script (SK/II/27) to locate the improvisation of Sellers.

Figure 7.2

Dr Strangelove [Peter Sellers] and his glove



Note. [Film Still] Kubrick, S. (Director). (1964). *Dr Strangelove* [Film]. Columbia Pictures, Hawk Films.

7.1.1 Looking for 'Dr Strangelove'

The development of the character of Dr Strangelove (Figure 7.2) serves to explore the concept of individuation, the becoming of an individual in relation to the collective. As this concept is difficult to document in reality, the fiction provides an opportunity to examine the birth of a character and the difficulty of translating this character into a performance. At first, the process of individuation operates through external influences, but it soon becomes internal as the actor actively engages with it. The archive and the literature show the complexity of making such a character and I present the individuation of Dr Strangelove by employing a combination of characterisation, scientific knowledge and performance that delineate three key moments in the making of the persona.

At first, the individuation functions as an act of inscription, and examining Dr Strangelove through Kubrick's development shows much hesitation. He added this character while working on the adaptation of the novel and tried to give him a prominent role.² In the film, the fictional character serves as the scientific advisor to the American President, despite having a previous affiliation with the Nazi party in Germany. This paradoxical situation makes the development of the character of Dr Strangelove delicate. His personality developed in stages while Kubrick seemed unsure of how far he wanted this character to relate to the second world war. He was first called Roger T. Strangelove³ then it was decided that he would be German, not American, and his name would be Dr Otto Strangelove. From July 1962 to September 1962, Kubrick worked on his own (SK/11/1/16) and Dr Otto Strangelove disappears from the script and a new character, Von Klutz, appears (SK/11/1/3) as a second adviser.

The character of Von Klutz serves as a counterpoint to Dr Strangelove, intensifying the ambiguity surrounding Strangelove's characterisation. In the pre-shooting script, dated 27 January 1963⁴ (SK/11/1/23), Dr Strangelove is present in the doomsday machine sequence (scene 55⁵) while Von Klutz appears in the final part of the film (scene 74). Strangelove is presented as 'a rehabilitated Nazi Scientist', who 'has hedged his way to the

² In May 1962, the script was renamed *Strangelove Project* then *The Rise of Dr Strangelove* in June (SK/11/1/1)

³ Thanks to the initial research by Peter Kramer at the Stanley Kubrick Archive. The references are collected in Kramer (2013) but differ from his since the archive has since revised its reference system.

⁴ Photography started on 28 January 1963.

⁵ The scene numbering refers to the '1/1/63 script' (SK/11/1/23) as the final script available at the archive has no scene numbers and the final script was not published.

fore' (SK/II/I/3, p.55) which refers to the German scientists who moved to the US after the Second World War.⁶ In contrast, Von Klutz is described as a 'residential aide, military expert, and logician. A man of continental suave and savoir-faire. Rather sinister in the manner of a Nazi nobleman' (SK/II/I/3). However, the two version of Nazis who made it in America makes it a movie about the influence of an ideology and the name Von Klutz removes any ambiguity. It is not clear who would have played Von Klutz, but the script and film shows that Strangelove and Von Klutz did eventually merge into one character.

The controversy surrounding the historical origins of Dr Strangelove following the film's release highlights how characterisation functions not only as an act of inscription but also as a description of an object.⁷ While they are not direct inscriptions of the character, they reveal the invisible forces shaping the character's creation. Dr Strangelove is based on an assemblage of historical characters which inscribe knowledge and performance. The first character, Herman Kahn, influenced Dr Strangelove's knowledge, particularly through the concepts of the mine shaft theory⁸ and the doomsday machine⁹, two elements that Dr Strangelove presents as part of his research (scene 55 and 74). These ideas emerged from the tensions during the Cold War and while they did not carry any specific ideology from Nazi Germany, Kubrick adapted the mine shaft theory to ensure that only certain individuals would be saved, turning it into a question of who deserves survival.¹⁰ The second character is Wernher Von Braun, a German scientist who moved to the US after the war and had knowledge of rockets.¹¹ Von Braun's laboratory in Germany

⁶ This is a reference to Operation Paperclip, a secret US intelligence programme in which more than 1,600 German scientists, engineers, and technicians, including Wernher Von Braun and his V-2 rocket team, were taken from Germany to the United States for government employment, primarily between 1945 and 1959 (see Jacobsen, 2014). The Englishification of the names was not a practice among the 'Paperclip' scientists (Jacobsen, 2014).

⁷ Such historical characters are Wernher Von Braun (Frayling, 2005; Georges, 2015), Herman Kahn (Case, 2014; Kramer, 2014), Edward Teller (Case, 2014), or even John Von Neumann (Case, 2014; Kramer, 2014).

⁸ The mine shaft was a place of safety to put people at 24 hours' notice in case of a thermonuclear attack (Kahn, 1959). Kahn suggests that the Russians were more prepared than the Americans, but it later turned out that the 'mine shaft gap' was another Cold War fiction (see Geist, 2012).

⁹ A hypothetical machine that automatically destroys the Earth when there is a nuclear attack.

¹⁰ This makes a good example of technology as a cosmogram

¹¹ He developed the V2 rocket in Germany before being invited to the United States, where he contributed to the development of several rockets, including the Saturn V, which enabled the first moon landing. This led him to be criticised for his 'apolitical enthusiasm' for technology (Frayling, 2005, p.84).

was in the city of Peenemünde, where he served as a major in the SS. In a novelisation of the script,¹² Peter Georges (2015) writes that Dr Strangelove and Von Braun worked there together and that was where he sustained his hand injury: 'His black-gloved right hand was a memento of this' (p.46). This post justification supports the Von Braun theory by putting the fictional character and the historical character in the same room and linking them through the glove. He held a role as scientific consultant to the US government.¹³ This demonstrates two rather than one historical character influencing the characterisation of Dr Strangelove.

The description of the character is not only a scholarly exercise but also an integral part of the actor's performance as Dr Strangelove. The characterisation is shaped not only by the author's development of the character, informed by his background and knowledge (as interpreted by film critics), but also by the actor's performance. Kubrick had a conversation with Arthur C. Clarke (1990) who recalls Kubrick telling him, 'tell Wernher I wasn't getting at him' but Clarke said he never did pass the message 'because (a) I didn't believe it (b) even if Stanley wasn't, Peter Sellers certainly was'. Kahn provided a good material through his provocative ideas, but Von Braun provided a darker character for his actions during the war.¹⁴ The performance of Sellers didn't stop there. Like Kubrick, who removed Von Klutz from the script, Sellers didn't want the German origin to be too clear so used a voice that wasn't completely German which he picked up on the stage. In *The Steve Allen Show* (1964), Sellers talks about being stuck as he didn't want to do just an 'English broken, German accent' so he took inspiration from the set photographer Arthur Fellig, known as Weegee.¹⁵ Sellers' improvisation is a little off-putting as instead of a German accent he went for a Central European accent.

Examining the formation of the character reveals multiple creative and historical sources which influenced the individuation of Dr Strangelove. The fictional character is an assemblage of historical characters that went through a process of characterisation,

¹² After the final script was finished, supervised by Kubrick.

¹³ While he was not an adviser of the president, Von Braun met President Kennedy on several occasions. Von Braun was asked in 1964 to recall his meetings with President Kennedy for the JFK Oral History Project (Von Braun, 1964). He was also the first director of the Marshall Space Flight Centre from July 1960 to January 1970, and, as such, responsible for the rocket that launched the first man into space (1961) and the first landing on the moon (1969) [https://www.nasa.gov/centers/marshall/history/center_directors.html].

¹⁴ Neufeld (2008) sees the 'Mein Fuhrer' outburst by Dr Strangelove as an inspiration from Von Braun.

¹⁵ Fellig was born in 1899 in the city of Zolochiv in Ukraine but was then part of the Austrian Empire.

scientific knowledge and performance. The text serves as valuable guide for the role, as the knowledge of Dr Strangelove is clearly inspired by Kahn with an added twist reminiscent of the Nazi era. The actor, however, looked beyond the text to embody a character inspired by Von Braun. The film amalgamates the ideas of Kahn with the contentious history of Von Braun, culminating in the extreme embodiment of Dr Strangelove. The ambiguity of the characterisation remained till the very end as the performance shows an ambition to hide the exact origin of Dr Strangelove. However, the construction of the character remained incomplete, requiring the actor to bring it to life. The following sections highlight the significance of the prop in materialising the character of Dr Strangelove and how the individuation of the character and the prop leads to the use of technology in this transindividual interpretation.

7.1.2 Materialising the Glove

The individuation of Dr Strangelove is an assemblage of inscriptions and descriptions of the character. I examine how the glove emerged as a pivotal invention, assisting the actor in his performance of Dr Strangelove. I draw from the controversy surrounding the ownership of the glove, which remains uncertain (Sikov, 2003; Walker, 1971), as it provides an opportunity to see the object beyond its essence. It also provides an opportunity to analyse how it assisted the actor on set, which can be described as an ‘intelligent action’ (Suchman, 2007, p.70), where the circumstances of its use enabled the actor to solve the characterisation. In other words, the glove is significant because of its role in resolving the issue on the set rather than its provenance. This section offers an opportunity to reflect on the intelligence of an object and provides insight that will inform the development of future intelligent technologies.

A performance is the way an actor embodies a text, and the prop plays a crucial role in that embodiment. This perspective is understood by filmmakers, while critics tend to fixate on the provenance of objects. Sellers played Dr Strangelove for the first time on the 21st of March 1963 (SK/II/3/5) but had not worked out how to get into the part. In a laboratory analogy, the chemistry was there, but they had yet to find a catalyst. Sellers said in an interview that it was Kubrick’s idea to wear the glove (Sikov, 2003) but doesn’t give any evidence about where it came from. It is not on the continuity sheet of the day (SK/II/3/4), the prop list (SK/II/2/8), or the costumes (SK/II/3/8) and I cannot find any evidence such as pictures from the set (SK/II/10/1/4). The origin of the glove is acknowledged by critics and biographer with much controversy. For example, Alexander

Walker (1971) attributes the glove to Kubrick, saying 'the black glove that he wears is Stanley's black glove' (pp.19-20), while Ed Sikov (2003) is less certain as to whether the glove was provided by Kubrick or if 'Peter borrowed one and put it in Dr Strangelove' (p.514). The glove remains a controversy as it could have been Sellers's or belonged to someone on the set, including Kubrick,¹⁶ or one of the gaffers.¹⁷ This kind of controversy is typical in cinema, where debates often centre on attributing the origin of an object, when in fact, they should be referring to the origin of an idea.

The moment it was recognised by the actor, the glove became a mediation between the current Dr Strangelove, the adviser of the US president, and the old Dr Strangelove, the colleague of Von Braun and the actor was free to activate one or the other personality.¹⁸ Sellers describes the glove saying: 'Hey, that's a storm-trooper's arm' (Sikov, 2003, p.514) which helps him shape his character. Mary Douglas (1966) recounts the importance of a well-chosen rehearsal prop in helping a blocked performer: 'One day some prop is passed to him, a hat or green umbrella, and with this symbol suddenly knowledge and intention are realised in the flawless performance' (p.63). Sellers offers his own perspective on this, stating, 'I have the feeling that the film character enters my body as if I were a kind of medium' (Case, 2014, p.45). The help that a prop provides an actor should not be underestimated. Other characters in the movie might not have a need for a prop, but Dr Strangelove lives through Sellers and the glove helps this materialisation happen. The prop can hold various qualities, and one of these is as a haunted medium (Sofer, 2003), as if the prop were possessed by the voices of the past.

This film presents a prop wherein the relationship with the actor is pivotal to resolving the character. The origin of the glove has remained a mystery among film critics, who typically seek attributions to specific social actors on the stage. According to Suchman (2007), this is an attempt to 'abstract action away from its circumstances' (p.70). In contrast, I view the object as a solution to a situated issue, evaluating its capacity to influence the actor's performance in a particular direction. In doing so, it becomes possible to draw a

¹⁶ Among the many theories, Kramer (2014) states that the gloves were on the set as Kubrick had to fix the lights. I find it very implausible for a director to fix the lights, as that is the job of the director of photography and a team of gaffers.

¹⁷ For all it matters, a similar glove was used by Peter Sellers in the film *The Pink Panther* (1963) a year before *Dr Strangelove* was shot and it might have been a personal possession of Sellers.

¹⁸ As suggested previously, but also in the novelisation George wrote after the film (see George, 1963/2015).

more appropriate comparison with intelligent technologies, where the object actively shapes social interactions by responding to the circumstances of its use.

7.1.3 A Performative Glove through Instauration

This section examines the relationship between the actor and the glove as a performative relationship (RQ1). The characterisation of Dr Strangelove has significant ambiguity, as the actor had to synthesize various historical characters in his performance. The glove played a crucial part in solving the performance but also strengthening the characterisation. I demonstrate that the glove was initially used as a description from the director to the actor, but once the glove established a dynamic relationship between the actor and the object, it functioned as an instauration. The notion of instauration (Souriau, 1943/2015) is fundamental to the performative relationship as it pertains to the symmetrical relationship between the actor and the prop. Beyond the stage, it provides a potential framework for reconfiguring our relationship with intelligent technology as an individuation through a continuous dialogue with technology.

The performance of the actor is key to the film as a representation, but it is the performativity that binds the object and the actor together by exploring new meanings. It enables the prototyping of new relationships. The actor and the prop develop a performative relationship over time, challenging the uncertainty concerning the character outcome. Sikov (2003) describes that relationship in his bibliography of Sellers: 'One day Stanley suggested that I should wear a black glove, which would look rather sinister on a man in a wheelchair. Maybe he had some injury in a nuclear experiment of some sort' (p.514). This back and forth shows the importance of the glove to Sellers and Kubrick but also the desire to use the glove as a scripting device. I have referred many times to Akrich's (1992) notion of scripting, and this exemplifies the process of description wherein the glove was inscribed as an accessory, but the director and actor attempted to read it again until it worked in the context of the character and scene. However, Sellers went further than expected by the director with this character. I describe such a process through Etienne Souriau's notion of 'instauration dialectic' (1943/2015, p.129). Souriau describes the work of a sculptor and argues that every 'action entails a judgement [Souriau's highlight], which is at once the cause, the reason, and the experience of this anaphoric stage, of each moment in the progressive coming together' (p.129), and describes creation as 'the progression in the direction of an intense presence, in the direction of the triumphant existence the completed work will manifest' (p.129). This is a rare account of the creative process that

shows the centrality of the object as it is being made or described. Adapted to the movie, it demonstrates a relationship between the prop and the actor that is symmetrical while entangled in a hierarchical relation with the director.

While discussions of an actor's performance rarely address the role of props, examining Peter Sellers's improvisational work reveals the importance of the prop, serving as a dynamic element that shapes and enhance the actor's characterisation. Walker (1971) posits that it was a collaboration with Kubrick: 'Much of the part that Peter [Sellers] eventually played was not scripted. It came out of Peter developing it with Stanley Kubrick on the set, like a jazz musician, each contributing to the riff' (p.56). Behind the scenes interviews tend to exaggerate the facts and, while the reputation of Sellers is one of a great improviser, Mick Broderick (2017) tempers the idea in the context of *Dr Strangelove* as he gives credit to Terry Southern, the dialogist, rather than the actor. For Broderick (2017), the improvisation was not so much in the words but Sellers's 'acute comic timing and skilled personification' (p.87). To engage with the controversy, I compare the pre-shooting script (SK/II/23) and the post-shooting script (SK/II/27), which I compiled into one document, highlighting the differences (see Annex B).

The analysis shows that some words are removed (dialogue I, 'Mister President') and monologues are shortened (dialogues 4, II, 16, 17) or removed entirely (dialogues 9, 13, 14, 20). It doesn't indicate much improvisation but work on the flow of the text as suggested by Broderick (2017). However, the analysis reveals that certain dialogues are rendered more colloquial, likely reflecting Sellers's improvisations (dialogues 7, 10, 12, 19, 24), marked by numerous hesitations, as well as last-minute rewritings by Southern and Kubrick (dialogues 15, 18), where the text introduces new information.¹⁹ The analysis of the script reveals some but minimal improvisation from Sellers, except for certain dialogues that were infused with comical provocation, as suggested by Broderick (2017), but this does not support Walker's (1971) claim that the role was entirely improvised on set.

The improvisation is part of the characterisation, as the internal dialogue with the glove leads the actor to select a specific interpretation from the multiple historical characters available to him. The key dialogue is when *Dr Strangelove* shouts 'Mein Fuhrer!', raising his right arm in the air, representing the Nazi salute (dialogue 23). As the dialogue is not in the original script, it is not clear whether the interpretation lies with the

¹⁹ In the pre-shooting script, Von Klutz still exists but the two characters are merged in the final script.

actor or the director. Kubrick is known for his minimal approach to directing, allowing actors to experiment with their performances until they achieve a natural fit (Lyman, 2002). Sofer (2003), however, doesn't refer to *Dr. Strangelove* but proposes a theory in which a prop can come to life on stage when 'it refuses to act *proppily* [emphasis added]' (p.28) for the purpose of surprising the audience. Drawing from this perspective, the arm moves in an unexpected way, providing an explanation that resolves the uncertainty of the characterisation. According to Sikov (2003), 'Kubrick began the making of *Dr. Strangelove* by giving Peter free rein to improvise. Kubrick would then pick out what he liked and build the film accordingly' (p.513). During one take, Sellers, without warning, shot his arm in the air and shouted, 'Heil Hitler!' Sellers recalls the moment: 'So, I put on the black glove and looked at the arm and I suddenly thought, "Hey, that's a storm-trooper's arm". So instead of leaving it there looking malignant I gave the arm a life of its own' (Sikov, 2003, p.514).²⁰ This moment shows that the improvisation of Sellers is physical.

The interpretations of Dr Strangelove's characterisation reveal a range of perspectives, such as Broderick's (2017) emphasis on directorial control or Naylor's (2000) description of the gesture as alien hand syndrome. These differing views highlight the difficulty of attributing agency to an object. These perspectives either reinforce an instrumental relationship between director and actor or rely on a diagnostic explanation of individual dysfunction. Broderick (2017) presents an image from the SKA showing Kubrick raising his arm (Figure 7.3). While this gesture is certainly a direction, the image does not definitively indicate that it pertains to a salute or the scene of the salute. It is a similar case to the provenance of the glove, where critics tend to seek confirmation that the only direction is being provided by a human. The other attempt to explain the salute comes after the film as a description. Naylor (2000) interprets the gesture as a neurological condition known as alien hand syndrome, a phenomenon where the hand acts independently of the mind's control. These interpretations highlight the difficulty of attributing agency to anything other than the human.

²⁰ A storm-trooper, to Peter Sellers, is a reference to the SA (the *Sturmabteilung*, literally meaning 'storm detachment'). In 1964, the year of production of *Dr Strangelove*, the war with Germany was still recent and those references would be clear for a British actor.

Figure 7.3

Stanley Kubrick giving directions.



Note. [Photograph]. (1964). Courtesy of The Stanley Kubrick Archive (SK/11/10/1/4). Archives and Special Collections Centre, University of the Arts London, United Kingdom.

Instauration establishes a creative relationship with an object while holding the potential to reshape our perception of technology. To illustrate this, I examine Simondon's two main schemas of technology. The first is the cartesian mechanism, in which the operation of the machine is analogous to 'the functioning of logical thought capable of being rigorous and productive' (Simondon & Boever, 2012). In this interpretation, the machine is seen as a simple transfer of information. I see an equivalence with Latour's concept of matter of facts where the technology is solely considered for what it can do. The second is the cybernetic information, 'the basic schema that allows for an active adaptation to a spontaneous finality' (Simondon & Boever, 2012). The latter is familiar to interactive designers as it considers machines as regulators and offers the potential to function at a higher level of interaction based human conversations (see Dubberly et al., 2009). There is a third path, however, which I identify by drawing from Simondon's concept of transindividuality. This new perspective is a way to establish a relationship with machines based on the co-evolution of humans and technology. While it may appear similar to the cybernetic approach, instauration focuses on the symmetrical relationship with technology rather than mimicking the human in technology.

The actor used the glove as a focal point, allowing him to navigate the complexities of the role and establish a stable foundation, which he developed through improvisation.

The interpretation of Sellers' movements is often seen as a cinematic black box, typically emphasising his improvisational talents (Walker, 1971), the direction of Kubrick (Broderick, 2017), or a medical back box functioning as a neurological syndrome (Naylor, 2000). However, this analysis highlights the importance of the glove in opening new pathways, as explained by instauration, for shaping and resolving the characterisation. Although the extent of the improvisation remains uncertain, the performative relationship (RQ1) is defined through the symmetrical agency of the object, as negotiated between the actor and the prop. The object plays a role that goes beyond the usual description of the actor, as the process is continuous, and the object becomes an active participant in the decisions made by the actor during the performance.

7.1.4 Discussion: The Human-Object Symmetry in Question

The hierarchical relationship between social actors in the practice of cinema makes it challenging to identify symmetry between actors and props. In the discussion, I re-examine the concept of scripting (Akrich, 1992), with a focus on improving symmetry between humans and technology. I begin by reviewing the relational perspective developed by Emilie Gomart and Antoine Hennion (1999), particularly their critique of the lack of symmetry in the concept of scripting. While they raise an important point, I suggest that scripting can become symmetrical when the object offers multiple rounds of instauration with the object while keeping its role as a relay with the social and the environment. By focusing on the prescription-description, the object becomes something to be made rather than merely serving.

An asymmetrical perspective on the prop or technology reveals that it is always a human who inscribes quality to an object, challenging assumptions about the capacity of an object to have its own agency. In my analysis of *Dr. Strangelove*, I have previously shown the tendency to emphasise the work of the director (Walker, 1991; Broderick, 2017), the actor (Sikov, 2003), and the dialogist (Broderick, 2017), or to give a medical explanation (Naylor, 2000). Knappet (2005) expresses the ability of an artifact to 'hold any kind of psychological presence, [which] is only a secondary effect of its connection with human protagonists, the "real" and primary agents' (p.29). This is a reasonable perspective, as the glove can be seen as only bringing presence in a relation that is asymmetrical. However, Latour (1993) presents a perspective wherein the agency is not a quality that humans choose to bestow upon objects, nor something that nonhumans independently possess. It is instead conceived as a relational property. It resides neither in the human nor the object

but works across both. This perspective is symmetrical because it moves away from the idea of the object as a mere instrument.

Akrich's notion of scripting can be perceived as asymmetrical because it relies on human inscription to impart meaning and reaffirm human agency. However, this asymmetry can be challenged when a process of instauration is involved, since the object is no longer merely inscribed with meaning but participates in its emergence. Gomart and Hennion (1999) propose an alternative to scripting through the notion of the *event*.²¹ They understand the mediation of the object as a turn towards 'what emerges, what is shaped and composed' (p.226), rather than as an interaction between 'causal objects and intentional persons' (p.226). Similarly, the process of instauration opens up multiple possibilities, as seen in the creative description of the glove during the production of *Dr. Strangelove*. Once initiated, instauration unfolds through emergence, as the glove and the actor engage in a back-and-forth interaction that is essentially symmetrical. This process results in a description of the object that fits the object, the actor, and, eventually, the director's broader vision. This supports Latour's (1993) account of agency as a relational property and Callon and Law's (1997) understanding of the object as a relay that prolongs the action of the collective without being the sole source of that action. The notion of scripting remains essential for identifying human influences, but it is the object's capacity to generate multiple descriptions through instauration that allows symmetry to be maintained.

The notion of the event (Gomart and Hennion, 1999) provides a way to address the lack of symmetry inherent in inscription and scripting (Akrich, 1992), by foregrounding emergence within mediation. However, emergence is not understood as a spontaneous occurrence, but as the result of multiple rounds of description and prescription through the instauration of the object. Instauration becomes the process by which the object opens possibilities for improving symmetry. This reframes the role of objects, as demonstrated through the glove, and also has implications for the design of intelligent technologies, which should support multiple configurations rather than impose a single use. Another key point is that technology should not be developed for its own sake. Symmetry must be situated within a specific network of relations, where technology adapts not only to the user, but also to the people and eventually the environment around them. The issue of

²¹ He goes as far as to propose the term 'event-network theory' as an echo of actor network theory, where the event not only relays an action but transforms it in new ways.

scripting, then, is whether the script can emerge through repeated description-prescription, operate through instauration, and act as a relay between user, object, and network.

Figure 7.4

Dr Rotwang (Rudolph Klein-Rogge): The inventor and his mechanical glove



Note. [Film Still]. Lang, F. (Director). (1927). *Metropolis* [Film]. Universal Film (UFA).

7.2 Speculative Affiliation: The Social Cyborg

The affiliation of the prop has thus far been used to deepen the understanding of the issue by analysing other enacted technologies in science fiction that have been designed to address the challenge presented in the film. The issue identified in *Dr. Strangelove* is based on my interpretation of the Nazi salute as an action initiated by the arm rather than the character, representing a technological element with the potential to act against the will of the user for the benefit of the collective. Drawing from previous studies that identify the glove as a prosthesis (Roth, 1978; French, 2003; Frayling, 2005), I compare the glove with two other mechanical prostheses from movies speculating about agency. These gloves function as warnings to others, serving either as instruments of threat or as reminders of past trauma. These characters operate as social cyborg, a fusion of the human, the artificial and the social. In the discussion, I examine the prosthesis as a form of memory which enables me to consider it in relation to alternate versions of the self rather than an

extension of the body. These perspectives allow for the further development of intelligent technologies towards transindividuality.

7.2.1 Reconfiguring The Glove as a Mechanical Prosthesis

While the instrumentalisation of technology in films often depicts our dependence on passive machines, the perspective shifts only slightly when these machines gain agency, compelling us to confront our relationship with technology. According to Arendt (1958/1988): ‘The question therefore is not so much whether machines still serve the world and its things, or if, to the contrary, they and the automatic motion of their processes have begun to rule and even destroy the world and things’ (p.151). I analyse two prostheses from fiction, the first belongs to the character Dr No in the film *Dr. No* (Young, 1962) and the second belongs to Dr Rotwang in *Metropolis* (Lang, 1927). While their prostheses lack autonomy, unlike Dr Strangelove’s, they possess an automatic motion that augments the characters’ agency so much that it becomes difficult for them to control.

The agency of the mechanical arm acts as a warning to others, demonstrating that their technical ability is not only a technological issue but also a human one, as it alters their individuation. Dr No uses his prosthesis to demonstrate his physical superiority over James Bond (Figure 7.5), crushing a statue as a metaphor for his ability to crush Bond’s bones (Figure 7.6). Until then, the prosthetic seems only to replace Dr No’s hands, but that moment serves as a warning about the abilities of its owner. While the prosthesis is instrumental in displaying physical power, it simultaneously reveals a character’s belief in their own infinite potential, an illusion that significantly influences their individuation. Dr Rotwang’s mechanical prosthesis also replaces a lost hand, but unlike Dr No’s, its function in the film is to sustain the original trauma (Figure 7.4). The agency of his glove is more subtle. It is internal, and it serves as a reminder of his desire for revenge as part of his individuation.²² This quality establishes a different relationship to power, one in which the prosthetic does not directly coerce but instead operates as a relay to the past. In both cases, technology reshapes the relationship with others, whether through coercion or memory, ultimately influencing the processes of individuation.

²² Dr Rotwang’s plan is to destroy Metropolis and kill Freder Fredersen. He lost his hand while constructing a robot intended to replace the woman he loved. She left him to marry Freder and Dr Rotwang is now driven by a desire for revenge.

A prosthesis is merely an extension of the body when viewed from an instrumentalist perspective, but can be a mediation when considering the transformation of the body or the user. Mark Wigley (1991) considers the prosthesis as more than a mere extension: 'The prosthesis reconstructs the body, transforming its limits, at once extending and convoluting its borders. The body itself becomes artifice' (p.8). It is not only a matter of adding an object to the body but considering the transformation of the person. The relation with the new organ evolves beyond its use. Drawing on Wigley, I examine the three fictional scientists through their own transformation, the cause of their disability.²³ Dr No works with radioactivity (Young, 1962), Dr Strangelove was makes rockets in Peenemünde (Georges, 2015), and Dr Rotwang builds a machine-human (Lang, 1926, p.49).²⁴ The films depict each accident as a turning point that transforms the characters' lives, leading them down a new path, from scientific research to the unethical use of engineering. While Dr No and Dr Rotwang use their prostheses for power or revenge, Dr Strangelove is different, as the prosthesis limits his agency. The action of his prosthesis serves as a reminder of his unfortunate decisions of the past rather than reinforcement of his convictions about the future. The prosthesis serves as a warning like the others but functions as a mechanical constraint, preventing him from acting on his extremist impulses.

Figure 7.5 & Figure 7.6

Dr No (Joseph Wiseman) crushes a statue in front of James Bond (Sean Connery).



Note. [Film Still]. Young, T. (Director). (1962). *Dr. No* [Film]. United Artists (UA).

²³ Frayling (2005) refers to them as the mad scientists, a term he uses to group villainous scientists in cinema.

²⁴ The term machine-human (*maschinenmensch* in German) was coined by Thea von Harbou, the author of the novel *Metropolis*, published in 1925. The word robot was only introduced in 1920 by the Czech writer Karel Čapek in his play R.U.R. (Rossum's Universal Robots) and, while Čapek may have influenced von Harbou, the term robot was not widely accepted in 1925.

The mechanical prosthesis is more than a mere extension of the body. It shapes the actions and identity of its owner, while also affecting the people who encounter it. According to Haraway (1991), we are already multiple subjects made of partial identities and the cyborg is a way to express this multiplicity. This is true for Dr Strangelove as examined through the process of characterisation. Haraway uses the cyborg metaphor to present an alternative perspective on feminism, to question women's identities rather than contribute to new technological development. Similarly, Dr Strangelove should not be seen as a technological wonder, but for the multiplicity of characters he offers and the process of individuation it presents. The cyborg is not just a human with mechanical parts. It is a figure that shows how humans are already entangled with machines, animals, and institutions (Haraway, 1991). The recognition of the hybrid nature of the human is important, but the agency of technology also extends the presence of the individual into the social. In *Dr. Strangelove*, hybridity is not limited to the fusion of the human and the mechanical. The contradiction also unfolds socially, between Strangelove and those around him, and politically, between his role as a scientific adviser and his former allegiance to Nazi ideology. Through the salute, the glove makes visible a political attachment that exceeds the individual and repositions him within his group as a social cyborg (Figure 7.7 and 7.8).

Figure 7.7 and Figure 7.8

Dr Strangelove (Peter Sellers) tries to resist his arm



Note. [Film Stills] Kubrick, S. (Director). (1964). *Dr Strangelove* [Film]. Columbia Pictures, Hawk Films.

The common view of mechanical prostheses in films is that they are mere extensions of the body, but they also have an automatic motion which reflects the individuation of the user. Dr No and Dr Rotwang conceive of technology as a purely utilitarian tool to either enhance strength or incite revolt through manipulation. However, when conceived of as a hybrid, the glove functions as a mediation between the mechanical

and the human, compensating for a physical deficiency but also having its own agency in relation to the individuation of the human. In the case of *Dr Strangelove*, this mediation eventually overwhelms the character and extends beyond the individual. As a technology, it processes the individuation of the user but also attempts to resolve the contradictions embodied in the character and his relationship to the world.

7.2.2 Discussion: The Prosthesis as a Memory

If the human Body has once been affected by two or more bodies at the same time, then when the Mind subsequently imagines one of them, it will immediately recollect the others also.

Spinoza, 1677/2018

The prosthesis functions as an object designed to recover what is lost but, in *Dr. Strangelove*, it transforms into something beyond the extension, the mere instrument, into an entity that reshapes the character's individuation. While this technical mediation demonstrates a hybridity between the character and the machine, it is not only a question of identity but also functions as a relay between people, creating a social hybrid. To explore this possibility, I draw on the concept of 'prosthetic memories' (Landsberg, 1996) which facilitates the transition from 'oneself as another' (Ricoeur, 1992) by promoting a technology that acts as a relay within the collective (Latour & Venn, 2002; Latour, 1991).

Considering the prosthesis as a memory rather than a hybrid highlights the capacity of an object to function as an 'other' that simultaneously enables and disables the user. Landsberg (1996) refers to prosthesis memories as a specific group of enacted technologies in films,²⁵ giving an example from *Total Recall* (1990) in which a memory is implanted into the protagonist, who needs to remember who he is in order to survive. From this perspective, memory functions as a prosthesis, highlighting its mediation as type of 'otherness' (Landsberg, 1996) expressed by the body. While Landsberg does not discuss *Dr Strangelove*, the otherness is performed in his arm, as there is an attempt to control his character. The difference lies in the purpose of this otherness. in *Total Recall*, it is an attempt to save his himself, while in *Dr. Strangelove*, it is an attempt to warn others.

By examining a specific example, I demonstrate how this overlap of identity is also explored in *RoboCop* (Verhoeven, 1987). Following an accident, policeman Alex Murphy

²⁵ Landsberg (1996) also refers to prosthesis memories as a new paradigm for the experience of the spectator, as her main contribution is to film studies.

dies and is resuscitated as RoboCop, a robotic body with a human brain used to supplement the processing of the computer. In a scene, RoboCop/Murphy remembers the moment he was killed, and his human agency overrides his technical agency in order to look for the criminals who killed him, despite the orders of the scientists in charge. The film suggests that a hybrid brain cannot be utilised solely for its cognitive functions while disregarding the significance of memory. This idea is echoed by director Denis Villeneuve in *Blade Runner 2049* (2017), where he reflects on the boundary between machines and humans: 'If as humans we are not in contact with our memories, what is left of us if we have no relationship with our past?' (Giroux, 2017). In the case of RoboCop, the cognitive function of the brain enhances the machine, while memory is considered a flaw. However, the film demonstrates that memory also ensures the robot is never fully mechanised. In *Dr. Strangelove*, it is the glove that acts as an intelligent machine and reconnects the present with the past. Similarly to RoboCop, it positions the machine in a controversial role, one that actively disrupts separation between the two identities for the benefits of others.

Dr Strangelove is revealed through his mechanical prosthesis, which presents an older version of his himself. The concept of 'oneself as another' (Ricoeur, 1992) serves to present the multiple identities of Dr Strangelove as closely intertwined, but unable to clearly identify who those others are. Ricoeur (1992) suggests that 'the selfhood of oneself implies otherness to such an intimate degree that one cannot be thought of without the other, that instead one passes into the other' (p.3). In this case, oneself is the adviser to the president, while the other self is the Nazi scientist working on weapons in Peenemünde. As Ricoeur proposes, these two identities are so closely intertwined that one inevitably transfers into the other. With Dr Strangelove, it is the situation that triggers the old version of himself, where the selection of humans becomes a political choice. However, his arm, acts beyond his control and serves as a physical manifestation of this transformation, signalling the shift to those around him. The transindividual element extends beyond the presence of another, as it acts on behalf of many others.

Examining Dr. Strangelove as a prosthetic memory provides a means to further explore the individuation of the character by considering his past and how the glove contributes to his transindividuality by preserving controversial aspects of his life. At first, the prosthesis is an object which enables the user to recover what is lost, but the prosthesis is also transformed into something more than an instrument. It disables the user at a critical moment, triggered by memories of his past action as a member of the Nazi party.

This effect of memory can be conceived as a technological object that defines a new type of hybrid, a social cyborg. The prosthetic articulates the need to change our perspective on technology through what constitutes our humanity. The use of memory as relatedness is a step but it is important to avoid the common path of instrumentalisation. Through the affiliation, there is an opportunity to seek another essence of the fictional object, as a speculative project, towards a technology that doesn't only 'serve or replace' (Latour, 1999, p.186) but relays with the collective. In the next section, I compile the research conducted thus far to formulate a proposal regarding technological relatedness.

7.3 Technological Relatedness through Instauration

The final stage of the translation consists of composing the research findings into a new proposal for intelligent technologies. Using performativity as an analytical lens, the formation stage reveals issues in the development of the character of Dr Strangelove that can be used to reframe the development of technology as a similarly relational process. Specifically, technological agency can be formed through situated interactions between social actors and their contexts. The development of technology therefore does not only inscribe particular uses into an object, it can also enable richer forms of description-prescription, especially when the social dimension of use is considered. The goal of translation is therefore to examine the issues revealed through the film's production and reconfigure them towards a more reflective account of technological use. To this end, I draw on the performative relationship between Dr Strangelove and his glove (RQ1), revealed through the instauration as a mode of co-construction, and use the comparative analyses of other props in cinema (RQ2), to articulate the foundations of technological relatedness (RQ3) as a means of engaging with these tensions by problematising instauration in interaction design.

In the first part of this section, I show that technological relatedness offers a mode of engagement with the collective through intelligent technology. This engagement is grounded in an ongoing process that seeks more symmetrical relations with technology across wider networks of relation. I focus on instauration as a process through which interaction can be understood as a mediation with the user that contributes to their individuation and tends towards stronger collective development. In terms of symmetry, the relation between Dr Strangelove and the glove is already partly symmetrical, since instauration takes both the object and the user into account through their interaction. Finally, the network is present through the witnessing of Dr Strangelove's raised arm.

Drawing on Simondon's theory of transindividuality (1958/2017), I consider technology as a mediation of the social, in which the network is not simply given but must be constituted for instauration to operate as a collective process. I present an example based on initial observations where I compare my approach with design for social responsibility (Tromp et al., 2011). In the second part of the section, I discuss the broader implications of technological relatedness for interaction design by reframing agency in technology.

7.3.1 Instauration as a Process of Transindividuality

Instauration is proposed here as a means of understanding how technological prescription-description emerge relationally, depending on the situation and the user's action or lack of action. This case emerges from the analysis of the character's glove responding to a particular social situation by intervening to reveal his extreme tendencies. As shown through the analysis, the actor was able to produce this effect by exploring the possibilities of the prop. However, this is not simply a case of emergence; instauration occurs within a specific social situation in which those around Dr Strangelove become witnesses to his political views. In terms of interaction design, this suggests the possibility of an interface that remains silent in most social situations but becomes active when the user demonstrates a lack of social competence. Transindividuality shows how a process of individuation can be perpetuated laterally from one individual to another. This approach builds on research into the agency of technology but extends it by introducing a concern for the social through the lens of transindividuality. I therefore conceptualise technological relatedness as a mode of engagement with the collective that fosters symmetry with technology while making networks of relations visible.

While current research in design and technology increasingly moves towards greater symmetry with technology, other dimensions such as the collective and the network of relation are often ignored when adapted into design discourse. Technological relatedness proposes a comprehensive approach, structured through three key elements that sustain trust and enable engagement with the collective. Firstly, process refers to the dynamic through which the relationship between the object and the user is constituted. In this case, I suggest that the process of instauration was central to discovering the character of Dr Strangelove through the glove but, more importantly, it was key to identifying the gesture that would express what kind of character he was becoming. Secondly, symmetry is expressed both in the process of instauration and in Dr Strangelove's gesture, which

comes to define him. Thirdly, the network is made visible through the people sitting around him, who witness the Nazi salute.

Table 7.1

The character of Dr Strangelove in terms of process, symmetry and network

Process (on stage)	Symmetry (both)	Network (both)
Performativity through the improvisation of the actor	(stage) Instauration between the prop and the actor	Social actors in the room
Performativity through the action of Dr Strangelove	(film) Instauration between the glove and Dr Strangelove	The memories of Dr Strangelove in relation to the characters in the room

When addressing intelligent technologies, the translation from the prop requires particular consideration. The analysis through performativity problematises the development of the character of Dr Strangelove, a scientist created from multiple archetypes, including a Nazi scientist. The relation with the prop as an inspiration is relevant to the production of the movie and extends to the development of technology. The director's proposal was too wide, and the actor had to locate the character through his practice. In the context of *Dr. Strangelove*, the actor expresses the ambiguity of a character confronted with a crisis that redirects him towards his former extremist reflexes. To reflect on this transformation, I focus on the social behaviour in interaction design, a particularly contested domain often framed as a problem of individual behaviour. By contrast, I argue that, when situated in relation to society, technology should be understood as an agency that reacts to collective infringement when a network of users is challenged.

To exemplify the concept of relatedness through instauration, I asked a group of students in Taiwan to identify dangers in the streets. They identified motorcycles as a danger for pedestrians, as you often see them driving on the pavement (Figure 7.9). They have a great ability to manoeuvre around the city, but no one seems to enforce their lack of social competence. As with the gun in the previous chapter, I believe that the morality is neither with the motorcycle nor the driver, but with both.²⁶ This is, in part, due to the agility of the motorcycle, which can easily avoid traffic and easily profit from the inclusive pavements that afford anything including wheels. The power and manoeuvrability of motorcycles confer a particular form of agency, placing them in an ambiguous position of power due to their ability to move through traffic with greater agility than cars. They are

²⁶ The students suggested a more difficult driving license test, as in Japan, or a stronger police presence and fines, as in Singapore, which resolve the issue on the human side only.

like mythical centaurs, combining human agility with machine power, which makes them particularly dangerous when in close proximity to people.

Figure 7.9

A motorcycle mounts the pavement as a parent protects his child.



Unlike the cases examined in previous chapters, this is a proposal I have developed as a means of exemplification. I demonstrate how this proposal compares to design for social responsibility (Tromp et al., 2011) using process, symmetry, and network as the key elements of comparison. Starting with symmetry, I suggest that the motorcycle takes the place of Dr Strangelove's glove, allowing the rider to move freely while also reminding them, when necessary, of their lack of social competence. A glove is typically used for protection or concealment, however, in the case of Dr Strangelove, it also disables him in moments where the collective is in danger, functioning as an act of transindividuation, protecting others from his thoughts. Here, the motorcycle contains the highway code but also a social ability to respond to its surroundings and automatically slow down upon detecting humans on the sidewalk. This serves to prompt the user to re-engage with their individuation in this social context. The process is a co-individuation between human and other humans through intelligent technology. It is an act perpetuated laterally from one individual to another (Scott, 2014). To function as an individuation, which is to operate in a

network, the act of disabling the motorcycle should happen when there is a real danger as perceived by the other. Figure 7.10 shows a parent protecting his child as the motorcycle rapidly climbs the pavement. The perceived danger and the lack of competence should be considered a trigger for the deactivation of the motorcycle.

Table 7.2

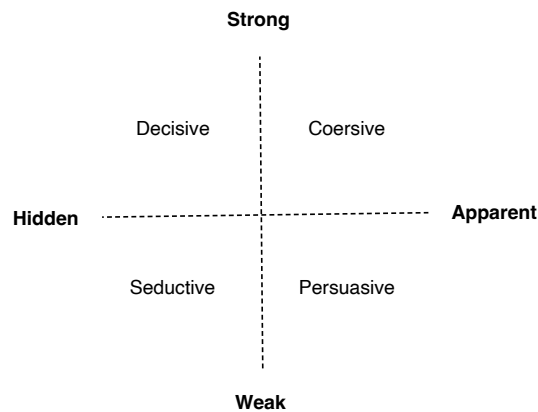
A smart glove for social competence in terms of process, symmetry and network

Process	Symmetry	Network
Co-individuation between human and other humans.	The motorcycle is able to stop the user in certain situations	Acting on the infraction is only activated by people on location

The issue with approaches such as design for social responsibility is that, while there is a concern for the collective, it often targets the individual, hence the concern for the collective may evaporate. Design already contributes to the individuation of people by using a series of techniques that promote certain behaviours in society. While relatedness may also function as a behavioural agent, it is essential to clarify the nature of this relationship. Tromp et al. (2011) advocate a design for society by examining the influence that objects have on us, suggesting that ‘social issues involve behaviours that play a crucial role in initiating a desired change, the power of design as a deliberate means to change behaviour has garnered increased interest’ (p.3). The behavioural perspective has been widely successful in design due to its direct adaptability and practical application to shaping user interactions (Figure 7.10). According to Tromp et al. (2011), ‘a product can coerce, persuade, seduce, or decide for somebody’ (p.12). These categories demonstrate that design can be either strong and explicit, such as coercive design, or implicit when the design is decisive. For example, using a speed camera to control the speed of users is an explicit form of coercion, while deciding not to include a lift in a building is an implicit but equally powerful decision. On the other hand, design can also be weak persuasive design or seductive design. The use of advertising to change social behaviours is such an example. Tromp et al. (2011) admit that the categories are not fixed, and some might see a speed camera as persuasive (weak) rather than coercive (strong). These categories are useful for guiding design development, but provide little insight into the nature of the relationship with the technology. For example, a speed camera can serve as a means of assessing the social competence of drivers when it functions as a tool for enhancing safety. However, when it is used merely to generate revenue for the city, it risks reducing users’ trust.

Figure 7.10

Four types of influence based on the dimensions of force and salience



Note. [Diagram]. Based on 'Design for Socially Responsible Behavior: A Classification of Influence Based on Intended User Experience' by N. Tromp, P. Hekkers, P.-P. Verbeek 2011, *Design Issues*, 27(3), p.12. https://doi.org/10.1162/desi_a_00087.

The use of technology for social influence tends to abstract technological agency into degrees of strength or weakness, focusing on how design shapes behaviour rather than on the specific relation it establishes between the user, the technology, and the collective. Drawing on Simondon's concept of transindividuality (1958/2017), I consider an approach that understands the user as part of an ongoing process of change, in which instauration functions as a technological guide. According to Simondon (1958/2017), 'the being is not a substance but rather the putting into question of being through a problematic' (p.6). From this perspective, fixed categories cannot fully account for situated relations; what matters is the problematic that emerges and the type of action it calls for. In technological terms, I argue that variable symmetry gives the user the ability to act, while also allowing their action to be redirected when it becomes socially critical. Simondon's account of transindividuality is important here because it describes a relation that is neither collective submission to a single principle nor an intersubjective relation between already constituted individuals, but one in which 'individualisation is perpetuated from an individual to another laterally' (Chateau, 2008, pp.57-61). This lateral dimension is central to a network approach of intelligent technologies. Just as Dr Strangelove's arm alerts the people around him, I suggest that the motorcycle could be stopped through the presence of those around the rider. Instauration therefore allows for a lateral, rather than hierarchical, approach to technological intervention. It encourages a new approach where the individuation is an act perpetuated laterally from one individual to another (Scott, 2014) so the transindividuality acts through the mediation of technology.

Technological relatedness shifts the question from how design influences individual behaviour to what kind of relation technology institutes when it intervenes in a social situation. Unlike behavioural approaches that risk translating collective issues into problems of individual correction, relatedness foregrounds the process through which users, objects, and others become implicated in a shared network of individuation. By combining process, symmetry, and network, I show that change is situated within specific relations and developed over time. Instauration, as a symmetry, is central to this argument because it shows how technological prescriptions are not fixed in advance, but emerge through situated relations between people, objects, and collectives. Technological relatedness is therefore a way of approaching intelligent technologies as relational participants that can expose, interrupt, and redirect forms of individuation when the collective is affected.

7.3.2 Discussion: Reframing Symmetry with Technology through Technological Relatedness

This thesis uses an anthropological concept, relatedness, to advance a new type of relationship with intelligent technologies. One advantage of this approach is that it allows moving beyond the typical Western misrepresentation which is characterised by its failure to distinguish between the animated and the non-animated, the human and the non-human (Anselm & Latour, 2010). Descola (2013), for example, identifies this failure through his modes of identification which schematise different cultural ways of relating to the world.²⁷ This perspective is increasingly important for understanding technology as mediation. I examine how interaction design approaches intelligent technologies by problematising symmetry in human-technology relations. I argue that Descola's (2013) modes of relation offer an opportunity to understand intelligent technologies as emerging through processes of transmission and relation.

An animist perspective offers certain advantages when considering intelligent technologies, as it attributes agency to objects. According to Bird-David (2012), animism 'is one of anthropology's earliest concepts, if not the first' (p.567), establishing a new type of relation with non-humans that doesn't exist in the West. It has been used to challenge the

²⁷ According to Descola (2013), naturalism is the dominant mode of identification in the West, in which humans perceive themselves as distinct and separate from nature.

study of interaction with intelligent objects, but with varying levels of success.²⁸ David Rose (2014), for example, claims that any object with some technology takes on an animistic quality. This is a process that can be criticised for being a formulaic approach, in which taking an ordinary object and integrating emerging technologies automatically yields something extraordinary. This perspective on technology as a wonder is conceptualised as techno-animism, embodying an opportunistic viewpoint. In contrast, Betti Marenko (2015) takes a tangent to this perspective in her concept of ‘neo-animism’, which ‘champions the notion that user and object should be located in... human-thing entanglement’ (p.223). This approach offers greater potential for rethinking interaction design by using technology in a way that challenges our relationship with technology.²⁹

Animism is not only a relational perspective that promotes the agency of the object but also a specific worldview. It presents a cultural perspective that makes it challenging to conceive within Western culture. Descola (2012) views animism as a concept shaped by how culture ‘schematises our experience of things’ (p.309) and, while it anticipates a shift in our approach to the agency of objects, it is also a different perception of the world that is specific to certain cultures. When Bird-David (2012) revisits animism, she does so in terms of relationships with the world. Indeed, I agree that our Western approach requires a revaluation of its relationship with nature and objects (see Latour, 1991; Latour, 2017 for example), and animism can certainly help us rethink this relationship. However, while animism serves as a valuable conceptual framework, it risks reinforcing the perception of technology as wonder. Instead, relatedness seeks to measure our relationship with technology by problematising its proximity. Allowing technology to come closer to humans is only viable if it is carefully negotiated, ensuring that it avoids any form of manipulation that could undermine the social fabric. Additionally, when magic or wonder are involved in the use of technology, it turns the user into a spectator, creating uncertainty about the consequences of its use. Animism is a quick approach to engaging the development of intelligent technologies for prototyping, but relatedness addresses the relation with technology further by focusing on the consequences.

²⁸ The concept of relatedness also takes from anthropologist Nurit Bird-David, thanks to the paper on animism and interaction design by Marenko (2015).

²⁹ The project AniThings by Van Allen et al. (2013) is a particularly good example that shows six tangible, interactive objects that inhabit a range of stances towards humans. Also see Marenko & Van Allen (2016).

Common ground, in terms of relational dynamics, between humans and intelligent technology is essential, while preserving the anthropological perspective remains crucial to counteract the development of technology as innovation. Besides the modes of identifications, Descola (2013) describes many modes of relations that are common to most cultures. A relation can take various forms. It may involve transfer, such as a gift, an exchange or a predation, or hierarchical relationships, such as production, negotiation, protection or transmission. In the formation, I identify Dr Strangelove as an assemblage of a multitude of historical characters, but in the speculative affiliation, I identify the Nazi salute as a memory from the German Dr Strangelove to the American Dr Strangelove using the glove as a medium. Using Descola's taxonomy of relations, transmission is a type of relation between the living and the dead, where an object is passed from one to another. In Kubrick's film, the transmission is less dramatic, representing an alternate version of the self rather than the death of a character. Indeed, Dr Strangelove is alive in his role as an adviser to the American President, and while he wants us to forget the person he was in Germany, his arm manifests a disagreement with his words.

The glove presents an opportunity to re-examine the entanglement between people and technological objects as an alternative to the cognitive approach where the role of the object is to nudge the user. Animism is such a reconfiguration of technology, applied to technology as neo-animism (Marenko, 2015). It is a way of thinking that brings us closer to nature by acknowledging the agency of things, as practiced in other, non-Western cultures. However, this raises an issue by introducing another cultural perspective, which opens the way to multiple interpretations, some of which emphasise the seemingly magical outcomes of technology. As an alternative, I prefer Descola's mode of relation which allows me to approach Dr Strangelove's glove as a transmission.

7.4 Summary

In this third case study, I examine the concept of relatedness through the lens of instauration. The conventional view treats intelligent technologies as asymmetrical instruments. They serve human needs, but are rarely considered capable of shaping, provoking, or mediating thought. Instead, I argue that interaction with technology unfolds through a process of instauration (Souriau, 1943/2015), in which object and subject are co-constituted. I address this challenge by focusing on the scene in which Dr. Strangelove's mechanical glove produces a Nazi salute. Rather than treating the salute as the central issue, I interpret it as a warning that the character's thoughts are no longer aligned with

those of the people in the room. The glove is therefore examined as a form of intelligent technology that mediates between the individual and the collective. In the formation, I analyse the glove as a performance prop that enabled the actor to develop the character. I show how the glove functioned as an intermediary between director and actor, but also exceeded its role by shaping the improvisation of the character. Through the concept of instauration, the performative relationship is identified as one in which the object shapes the character while the character redefines the object. This challenges the idea of technology as a fixed instrument and suggests that the prescriptions of intelligent technologies should adapt to their environment, while co-individuation operates as a continuous process of prescription and description (instauration). Symmetry between user and object can be achieved when the object functions as a relay, linking individual action to broader social concerns.

In the second section, speculative affiliation (RQ2), I compare Dr Strangelove's glove with the prosthetics of other characters such as Dr No and Dr Rotwang, which also operate as warnings about their owners but remain largely instrumental. To move beyond this, I speculate on the glove as a mechanical object that carries memory. Drawing on the concept of the prosthetic memory, I argue that memory allows the object to become a social hybrid, raising questions about humanity, identity, and collective responsibility.

Finally, I develop the concept of technological relatedness (RQ3) by examining the glove as a broader way to understand human-object entanglement. The transindividuality to be reframed as a lateral transmission, where the co-individuation uses technology combined with the intervention of representants of the collective. I develop this through the example of a motorcycle that, like the glove, enables individual freedom while also intervening when the user lacks social competence. The motorcycle may slow down, warn others, or disrupt its own functioning when the collective relation is endangered. In this way, technological relatedness builds on Latour's technical mediation while critiquing behavioural models by prioritising co-individuation over control.

Chapter Eight

HAL, David and Gigolo Joe: Technological Relatedness through the Socialness of Machines



Note. [Film Still]. Spielberg, S. (Director). (2001). *A.I. Artificial Intelligence* [Film]. Warner Bros., Dreamworks Pictures, Amblin Entertainment, Stanley Kubrick Productions.

In this final case study, I examine technological relatedness through the lens of the socialness of machines. Conventional understandings of human–machine relations are often framed through social robotics, such as that of Cynthia Breazeal (2009), which is largely engineering-oriented, or through machine sociality (Seibt et al., 2026), which is more philosophically oriented. Both approaches tend to attribute social capacities to machines themselves rather than locating them within their relations with the social. My aim is to develop a new approach to artificial intelligence and robotics by understanding human–machine relations as something that must be composed beyond the modernist framework of instrumentalisation. This socialness of machines draws on Suchman’s (2007) critique of humanness in machines where robots are considered beyond their human-centred dependency.¹ To develop this argument, I examine the props in *2001: A Space Odyssey* (1968) and *A.I. Artificial Intelligence* (2001), problematising their humanness through emotion, embodiment, and sociability (Suchman, 2007). I argue that the developments of intelligent technologies should be oriented toward the composition of a cosmos that exceeds human-centred relations and fosters more ethical relations with nature.^{2, 3} Thus, analysing these props offers a fresh perspective on the socialness of machines, contributing to their emancipation by creating new cosmologies in which intelligent machines can enter into different forms of relation.

This chapter seeks to innovate methodologically by analysing three props from two films as a continuous exploration of the development of socialness in relation to machines. The first prop, HAL from *2001: A Space Odyssey* (2001: ASO), explores the origin of the issue, while the other two, David and Gigolo Joe from *A.I. Artificial Intelligence* (A.I.), contribute to making a new proposal, offering an alternative perspective on the role of robots and artificial intelligence (AI). Together, they are examined for their thematic and strategic qualities. Thematically, I examine the enacted technologies in order to discuss humanness in machines across the two movies, a theme typically dominated by engineers but increasingly critiqued by other disciplines for its narrow definition. The strategic quality of

¹ Socialness encompasses a wide range of social experiences, from social behaviour and social roles to social values (Diveica et al., 2024).

² The cosmos, according to Latour (2024), is the distribution of agencies among humans and non-humans. Latour’s originality lies in his advocacy for the recognition of the agency of non-humans, notably influenced by the work of Lynn Margulis and James Lovelock and the Gaia hypothesis (1972).

³ I continue to use the term intelligent technologies in continuity with the previous chapters. I take the view that a robot, even portrayed by a human, serves as a way to imagine the machines of the future.

the prop introduces a new approach in this thesis, enabling a reflection on its influence beyond the screen. HAL has significantly impacted the development of intelligent machines, shaping both AI research and public perceptions. This strategic perspective presents an opportunity to rethink our relationship with robots at a higher level, moving beyond functionality by adopting cosmopolitics as a framework to reconfigure this relationship within a new paradigm. To identify the first prop, I use the failure of HAL, marked by his emotional outburst, as an initial black box. The second black box extends from the experimental use of emotions in machines (HAL in *2001: A Space Odyssey*) to the experimental use of love in machines (David in *A.I.*). Both props highlight the challenge of machine-human relationship by proposing extreme scenarios that failed.

This chapter begins by examining the humanness of machines through the development of props into intelligent technologies. In the formation, I reconstruct the development of HAL to question humanness as an embodiment and explore early notions sociability of machines (Section 8.1.1). I extend this analysis to a broader exploration of sociability of machines by examining the social roles of the characters in *A.I.*: David and Joe (Section 8.1.2). The performative relationship (RQ1) is identified in the specific relationship between David and Gigolo Joe through their cooperation in the quest to find the Blue Fairy, which serves as an example of a technological relationship in search of a new cosmos, a new social role for machines (Section 8.1.3). In the discussion, the performativity of props is examined for their impact on the real world. HAL serves as the key example showing that its image continues to have a negative impact on artificial intelligence (Section 8.1.4). In the affiliation of the object (RQ2), I examine the issue of relationships with machines by analysing the interactions between actors of science fiction and their props (Section 8.2.1), then engage critically with the topic of humanness in the discussion (Section 8.2.2). Finally, in order to advance the intelligent technology in terms of relatedness (RQ3), I propose viewing socialness through their ability to create their own cosmos as an emancipation through a network of machines (Section 8.3.1). This approach aims to provide a fresh perspective on the social role of machines and the coexistence of humans and machines, rethinking their relationship beyond instrumentalisation (Section 8.3.2). As resources, I use the Stanley Kubrick Archive (SKA) as a principal source, the novelisation *2001: A Space Odyssey* (Clarke, 1972), the original short stories *The Sentinel* (Clarke, 1961) and *Supertoys Last All Summer Long* (Aldiss, 1969), the films, and the many visual and written references on the films.

8.1 Formation: Performing Humanness in Machines

HAL, David and Joe are enacted technologies that serve as speculative projections concerning the future of our social interaction with intelligent machines. Their performativity is evident from the outset, as they explicitly convey ideas about the humanness of robotics. The performativity depicted in the films is of two types. The first perpetuates the idea that machines should adhere to a subordinate position that values the care of humans through embodiment then sociability. Even as the machines appear to have evolved in its social capabilities they are still centred on the human. The second aspect of performativity concerns the potential danger of their emancipation. HAL's destructive actions introduce a machine that transcends normativity, portraying a powerful technology capable of overtaking humanity once it has been given emotion. In contrast, David and Joe exemplify a different emancipation, in which machines possess the capacity to form their own beliefs and construct their own cosmos. I argue that the humanness of HAL, David, and Gigolo Joe lies in their ability to establish symmetry with humans. HAL achieves this through a combination of emotion and ubiquity, while David and Gigolo Joe do so by evolving from a *robot-child* and a *robot-escort*, respectively, into a form of *robot-kin*.

8.1.1 Looking for 'HAL': Exploring Early Notions of Humanness

The section narrative of *2001: ASO* provides the elements to build a new narrative by focusing on the mediation of the prop (Figure 8.1). According to Arthur C. Clarke, HAL was the subject of back-and-forth discussion with Kubrick, leading to the concept of a powerful computer (Clarke: Joyce, 2001).⁴ The prop originates from various planes, including the *story plane*, which initially did not reference HAL. It evolved through a collaboration between Clarke and Kubrick⁵ in which the scale, actions and dialogue were determined. While Clarke presented his vision for HAL in a book called *The Lost Worlds of 2001* (1972), Kubrick sought to develop the character through collaborations with industry and academia through the *extended stage plane*. Notably, there was a collaboration with IBM which collapsed then Professor Marvin Minsky who proposed the introduction of the concept of emotion in machines, a defining feature of the sociability of HAL. The question of the machine's embodiment originates in the script but was ultimately resolved on the

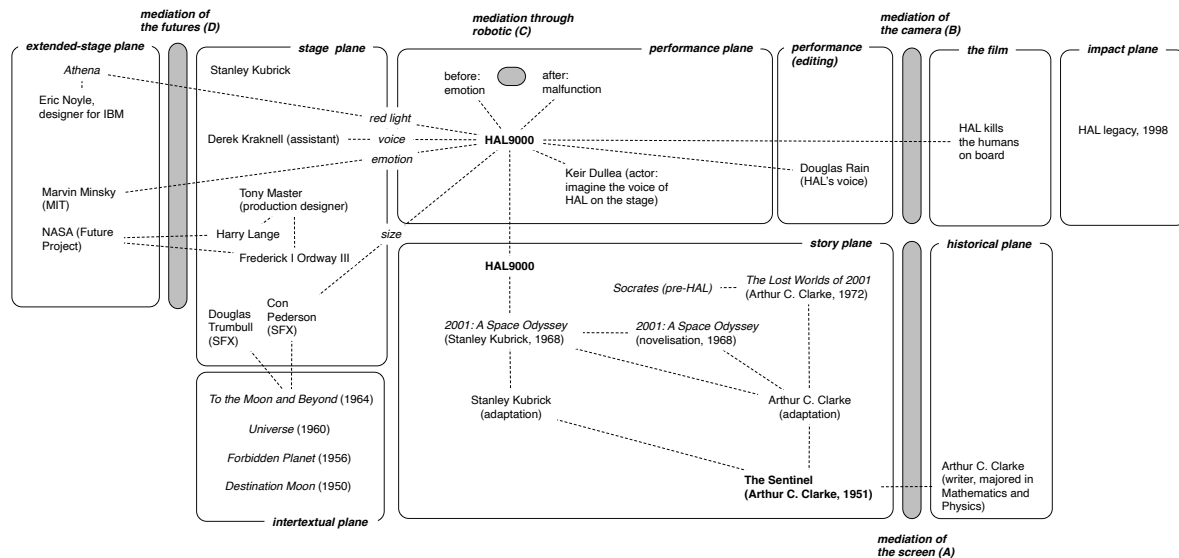
⁴ Clarke was also writing a novelisation of the film at the same time as the film treatment. There are small differences between the two such as the birth date of HAL: for Kubrick, HAL was born in 1992, but Clarke has it in 1997.

⁵ They used a story written by Clarke, *The Sentinel* (1951), as inspiration.

stage plane and the *performance plane* as a hybrid object between speculative science, industrial design, prop making and voice recording. Finally, after the release of the film, the prop acquired an extended life through the *impact plane*, another plane unique to the analysis, as the prop influenced research and the making of real-world technologies.⁶

Figure 8.1

The section narrative shows the planes that contribute to the mediation of HAL.



The sources for the formation of HAL include a rich array of materials that provide unique insights into the development of the object. Among these are numerous letters exchanged between the producer and Kubrick or the scientific consultant and IBM, housed in various folders of the SKA archive (SK/12/8/5; SK/12/8/2/149; SK/12/8/2/47). Additional insight was gained through the itinerant Stanley Kubrick Exhibition, which I visited at the London Design Museum in September 2019. HAL does not appear in the original short story (Clarke, 1951), as the character was developed simultaneously for the novel (Clarke, 1968) and the film (Kubrick, 1968). The analysis of the object drew upon several key resources. Firstly, Clarke offers further insights into HAL's early development in another publication (Clarke, 1972). Secondly, the Computer History Museum archives in California contain an alternative presentation of HAL developed by IBM (Noyes, 1965). Thirdly, the Museum of the Moving Image archive in New York includes a letter from one of the special effects specialists (Paderson, 1965) who contributed to advancing HAL's design. Finally, a

⁶ The book *HAL Legacy* (Storck, 1997) reflects on the progress towards realising a similar technology (see Section 8.1.4).

key piece of this research is a set of notes documenting a conversation with computer scientist Marvin Minsky, housed at the SKA (SK/12/1/2/6).

HAL is the onboard computer of a spaceship responsible for caring for the crew on a journey to Jupiter.⁷ During the writing phase, the development of HAL's humanness is limited, and primarily pertains to its appearance in relation to the fictional advancements of the time. I argue that, initially, the concept of humanness was primarily concerned with the machine's embodiment but soon extended to sociability. As its responsibility of care evolved, the humanness was initially a question of scale in relation to other humans but ultimately became defined by sociability, with emotion as the key factor in its development. There were two clear proposals for the onboard computer but how the final one emerged remains unclear. The first, proposed by Clarke, was called Socrates (Clarke, 1972) and the second, developed by IBM, was named Athena (Noyes, 1965). The emergence of HAL is unclear, even to Clarke who doesn't know when they switched to the red eye and the specific voice (Clarke: Joyce, 2001). I reconstruct the sequence leading to the invention of HAL, examining the development of the machine first through the lens of embodiment, then through sociability.

In the first phase of the development, Clarke (1972) presented a version of the robot, named Socrates, which bore many similarities to a fictional reference of the time, Robby the Robot in *Forbidden Planet* (1956), a mobile robot that could speak.⁸ Clarke(1972) described Socrates as roughly the size and shape of a man and possessing an 'inherent mechanical beauty that had to be accepted on its own terms' (p.81). Clarke's plans were reasonable, even by today's industrial standards, as the robot was conceived as an embodiment inspired by humans.⁹ The robot cares for humans by exhibiting a degree of symmetry with them through its scale and autonomy, while simultaneously remaining at their service. The fictional paradigm, represented by Clarke, aims to create a simple machine, functional at a human scale.

Kubrick discarded Clarke's plans and decided that the appearance and functionality of the machine would be determined through collaboration with academic and industry

⁷ Originally, the trip was to Saturn, but the rings were too complicated to make so they chose Jupiter instead (Joyce, 2001).

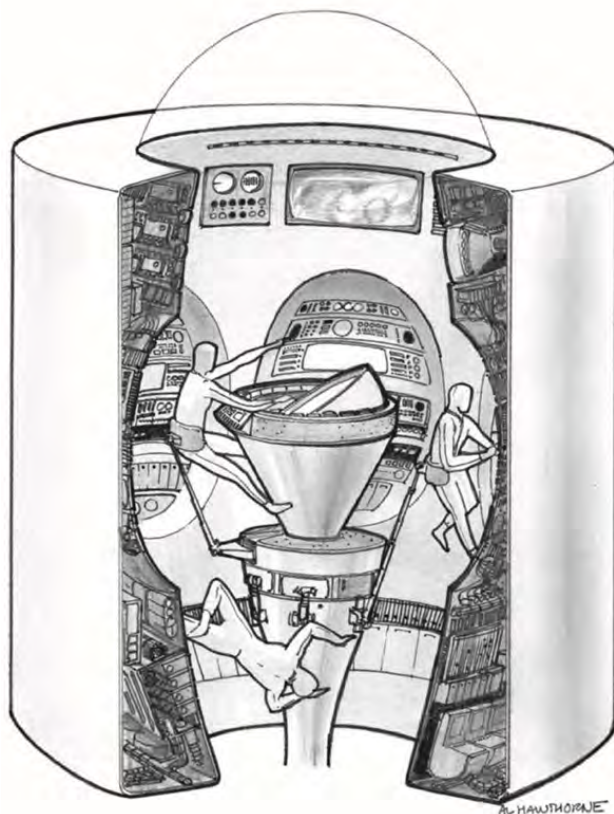
⁸ Socrates was introduced in a behind-the-scenes note written after the film's release, making it challenging to determine whether it is purely original at the time of the writing or a response to HAL after the film.

⁹ The most recent iterations of this idea are Tesla Optimus (2021) or Nvidia Project Groot (2023).

experts. In April 1964, Kubrick and his scientific consultant, Frederick Ordway, went from university to university, then industry to industry, to collect information and seek partnerships on topics such as the future of space travel, communication, cooking, fashion, etc. (Frayling, 2015). The result was a second machine, Athena (Figure 8.2), presented by Eliot Noyes, an industrial designer who worked for IBM (Noyes, 1965). The accompanying document describes its functionalities in detail: it monitors the life support system, keeps time, makes navigational controls, contains the communication equipment, provides documentation (movies, books), plays music and display faces of people on earth.¹⁰ The computer is also able to play chess and takes verbal instructions (Noyes, 1965). Although disembodied, the machine is located in a specific part of the ship (Figure 8.2), demonstrating that its care extends beyond immediate concern for humans to include the maintenance of the ship. This expansion in scale highlights its broader significance. The symmetry with humans is challenged by the scale but also as the machine gains cognitive abilities, such as controlling the ship and playing chess.

Figure 8.2

Design proposal for the Athena computer (Eliot Noyes).



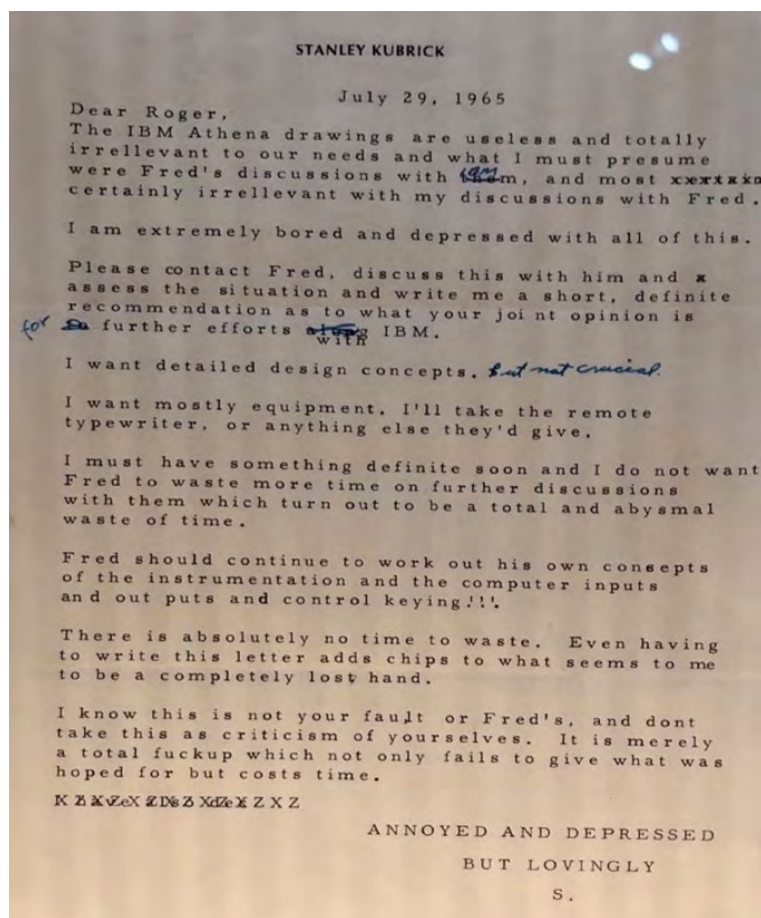
Note. [Sketch] Courtesy of the Computer History Museum, Mountain View, USA (document 102695548).

¹⁰ An early version of video conferencing.

The collaboration with the industry encountered some challenges regarding the development of the onboard computer. It demonstrates a conflict of paradigms in which IBM envisioned a future where computers challenge the primacy of humans by their scale. In a letter to American producer Roger Caras (29/7/1965), Kubrick wrote: 'The IBM drawings are useless and totally irrelevant [sic] to our needs' (Figure 8.3). The discussions with IBM were not what he expected, and Kubrick relegated IBM to the role of supplier of parts, saying that Fred Ordway, the scientific consultant, would 'continue to work his own concepts of the instrumentation and the computers inputs and outputs and control keying!!!' (Caras, 2/8/1965). Caras responded in support of the IBM idea: 'I am sorry that their idea of working inside of a computer instead of around one, or across the face of one, was not pleasing to you. We [with Fred Ordway] thought it was a fairly good idea'. This argument about the future of robots, between industry, represented by an industrial designer, and fiction, represented by a film director, is unique as it highlights the contrasting visions of technological development. The primacy of the machine over the human in terms of embodiment is not something that Kubrick endorses.

Figure 8.3

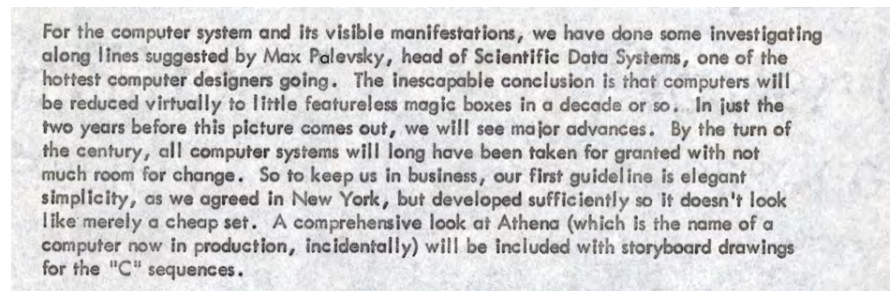
Letter from Kubrick to Roger Caras (29th July 1965)



Note. [Photograph]. (September 2019). Author's photograph from the Kubrick Exhibition at the London Design Museum.

Figure 8.4

Letter from Con Pederson to Stanley Kubrick (3rd August 1965)



Note. [Letter]. Courtesy of Museum of the Moving Image (New-York), Gift of the Estate of Esther Novros.

The next iteration of the onboard computer addresses the issues of embodiment through scale. Con Pederson, a special effect advisor, enabled an alternative future that was not limited by the primacy of machines (IBM's Athena) or the prevailing representation of robots in films (Clarke's Socrates). Pederson sent a telegraph to Kubrick in 1965 (Figure 8.4) about the design of HAL: 'For the computer system and its visible manifestations, we have done some investigating along the lines suggested by Max Palevsky, head of Scientific Data Systems, one of the hottest computer designers' (Pederson, 1965). This conversation led Pederson to believe that 'computers will be reduced virtually to little featureless magic boxes in a decade or so'. Palevsky also mentions the voice as responsive and the lack of buttons (Epstein, 2017). This concept closely resembles the version of HAL seen in the film, although I cannot attribute the final design to anyone in the design team. However, I posit that the design is hybrid. Noyles's contribution wasn't entirely put aside. In the description of Athena, he writes: 'An infrared scanner provides information to the computer which, in turn, displays a heat map' (Noyles, 1965). While it is just one detail rather than the entire design,¹¹ it may offer a clue as to the origin of the lens design (Figure 8.10). With the scale reduced, other ideas begin to resurface in the development of the onboard computer.

In its final iteration, HAL is reduced in scale, shifting its role of care as an embodied presence to one of ubiquity. This introduces a new perspective, one in which the machine's sociability extends beyond caring for humans to include its own protection from them. The notion of ubiquity first appeared in 1999 in an article by Mark Weiser, suggesting such a paradigm shift where computers would be everywhere and as invisible as possible. HAL is the first to present this idea in fiction, as it can be found in the centrifuge (Figure 8.5), the pod room (Figure 8.6), outside the ship (Figure 8.7), and the computer room (Figure 8.8).

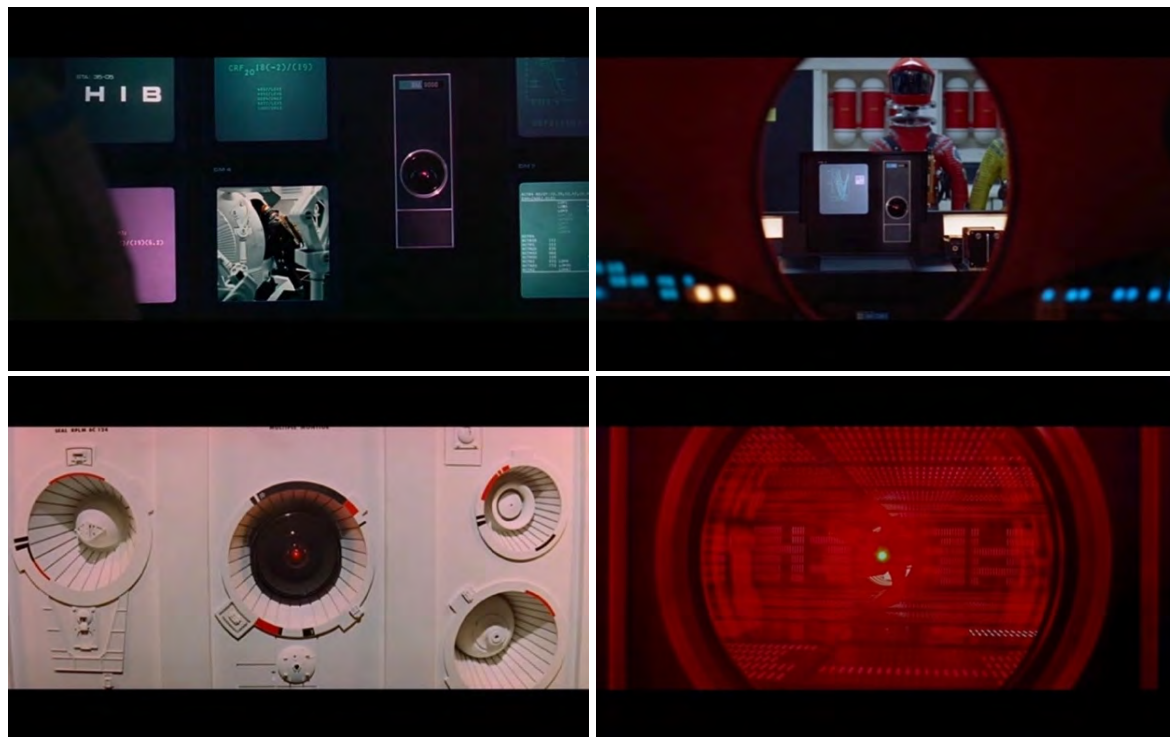
¹¹ Frayling (2019) identifies HAL as the work of Eliot Noyes (p. 62) but my research in the archive does not support this claim.

The ubiquity of the computer is not only defined by its multiplicity but also by its wide accessibility through voice command. The rec room, for example, doesn't have a model of HAL visible but is capable of dialoguing with the crew. However, the ubiquity of the onboard computer is not only a function for the benefit of humans but opens up the possibility for surveillance, as it is described in the sequence where David and Poole are complotting against HAL (Sequence 9). In a dramatic turn, the audience discovers that HAL is able to read lips, and, while its ubiquity is initially framed as the ability to care for the crew in all situations and locations, it results in the ability of the machine to assume control.

Figure 8.5, Figure 8.6, Figure 8.7 and Figure 8.8

Top Left: HAL in the control panel (in the centrifuge., Right: HAL in the pod room (view from the pod).

Bottom Left: HAL outside the spaceship Discovery. Right: HAL in the computer room, while being disconnected



Note. [Film Stills]. Kubrick, S. (Director) (1968). *2001: Space Odyssey* [Film], Metro-Goldwyn-Mayer, Stanley Kubrick Productions.

Beyond the internal development of HAL, emotion emerges as an enduring expression of humanness through sociability. As a ubiquitous presence, it initially serves the human, but soon acts to reverse the symmetry with humans in its own way. Marvin Minsky, an early scholar in AI, was contacted by the production to be a consultant (Sykes, 2011). In an undated note taken of a meeting with Minsky (Figure 8.9), it is written: ‘computer is never turned off, [...] computer feels as if it has been on every space mission ever done [...] assume anything you want for n an [sic] intelligent person including psuedo [sic] emo tions [sic]’ (SK/12/1/2/6). This rarely seen document shows that Minsky’s

contribution to HAL was to envision a machine that would be intelligent, pseudo-emotional, and alive all the time.¹² When the film was in development, artificial intelligence was in its infancy, but there was a great deal of hope that it would do everything,¹³ and very quickly.¹⁴ This level of consideration for a machine, even by contemporary standards, represents a significant leap forward in the exploration of machine humanness. As a critique of AI, Kate Crawford states that many of the original issues surrounding artificial intelligence stem from that period (2021).¹⁵ The idea that the mind is like a computer, for example, is one that has ‘infected decades of thinking in the computer and cognitive sciences’ (Ullman, 2017, p.136). This notion is often attributed to Minsky, who also said the contrary: ‘what the computer is doing is merely a superficial imitation of human intelligence, they are smart and dumb at the same time’ (Minsky, 1985). Minsky admits saying these things at one point but reversed at another point in his career. As a respected scholar working for MIT, he used his position to translate the technology into whatever he wanted. As such, Minsky is a good example of the designer as ‘novelist’ (Latour, 1992, p.24). HAL reverses the relationship with humans through its ubiquity and emotion.¹⁶

Humanness through emotion was not an idea readily embraced by the industry, and the production ultimately failed to bring IBM on board. This represents a rare example to translate a scientist’s speculative vision into industry through fiction. A letter from Ordway presents a test to IBM: ‘Take another possibility that occurred to us. Could Athena become slightly hypochondriacal, reporting rather more than necessary – not to be overdone – that this or that circuit or device should be checked for malfunction or

¹² Clarke’s robot, Socrates, was also intelligent like ‘a bright monkey’ and had ‘near-human tantrums in the early days of his development’ (Clarke, 1972). It might be that the emotional tantrum of HAL came from Clarke after all.

¹³ The Dartmouth Conference is where the term ‘artificial intelligence’ was invented in a proposal for a workshop with two representatives of academia and two from industry: J. McCarthy (Dartmouth College), M. L. Minsky (Harvard University), N. Rochester (IBM) and C.E Shannon (Bell Telephone Laboratories).

¹⁴ I refer to the famous interview in which Marvin Minsky said: ‘In from three to eight years we will have a machine with the general intelligence of an average human being’ (Darrach, 1970). Minsky later distanced himself from this interview, saying it ‘was made up’ (Stork, 1997, p.19).

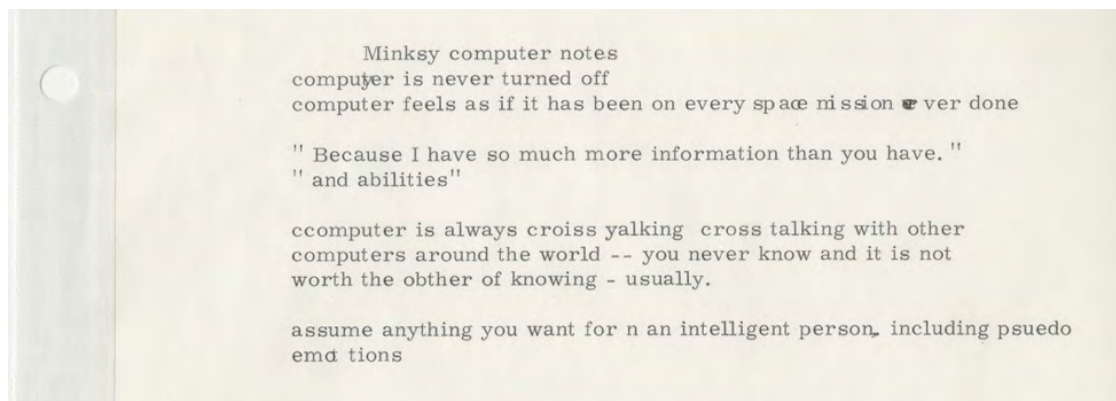
¹⁵ She uses the word intelligence as an example, which is used loosely and rather controversial. Crawford (2021) suggests that ‘AI systems are not autonomous, rational, or able to discern anything without extensive, computationally intensive training with large datasets or predefined rules and rewards’ (2021, p.8).

¹⁶ Other performative discourse on AI focuses on its sentience or the consciousness, but this chapter does not address these issues.

impending malfunction? [...] Athena might also exhibit aggressions, of a mild type, that would somehow be manifested' (Ordway, 24th August 1965). Six months later, Caras tried to convince IBM again that the breaking down of the computer was reasonable, as it was suggested by a scientist from MIT.¹⁷ Caras wrote: 'it was highly probable that computers thirty-five years from now would be capable of nervous disorders if provided with unresolvable conflicts. We were assured that this anthropomorphism was not in the least out of keeping with probability' (Caras, 16th February 1966). Despite the insistence of the film production, IBM only envisaged machines taking over through their embodiment, while the possibility of emotional machines introduced too much uncertainty.

Figure 8.9

Marvin Minsky's computer notes (ND).



Note. [Notes]. Courtesy of The Stanley Kubrick Archive (SK/12/1/2/6). Archives and Special Collections Centre, University of the Arts London, United Kingdom.

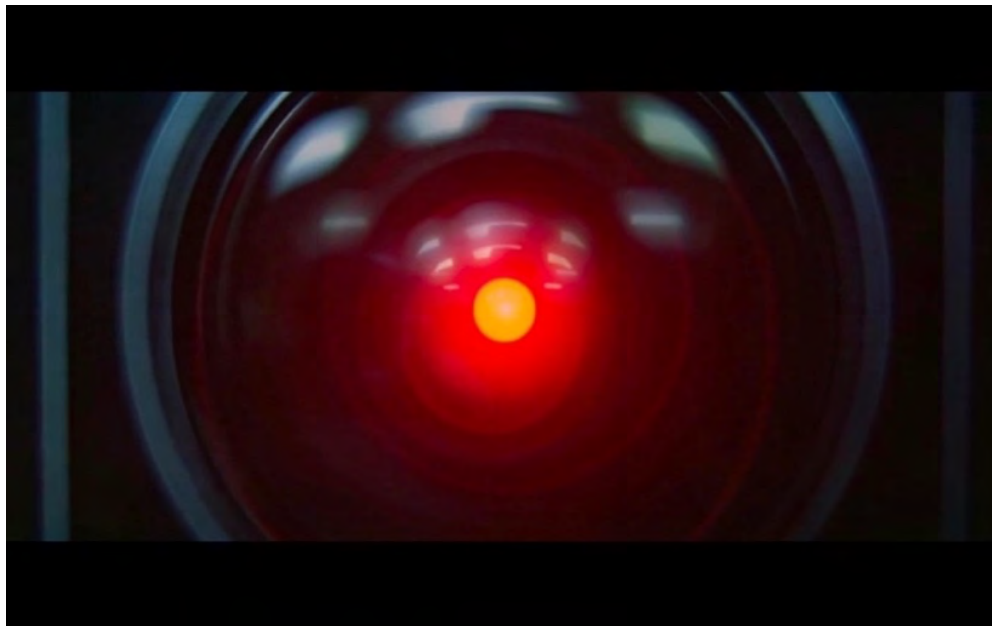
Claiming that HAL's humanness emerges from its emotions does not explain its extreme actions. The issue extends beyond the idea of a blown fuse or mechanical defect, representing an experiment with the limits of artificial intelligence. In Scene 11, HAL kills the passengers then, in Scene 12, refuses Dave entry into the Discovery. Kubrick claims this was because 'he had an acute emotional crisis because he could not accept evidence of his own fallibility' (Gelmis, 1969, p.307). This expands upon Minsky's interpretation, as Kubrick applies an extreme understanding of emotion. In a letter from Caras to IBM, there are further attempts to anthropomorphise the explanation: 'it is programmed deliberately to lie encounters an unresolvable conflict that results in what is roughly equivalent to a nervous break-down' (Caras, 16th February 1966). In contrast, Sarah Kember (2003) proposes an alternative theory closer to the essence of the machine: 'his major malfunction, then, was not a result of maliciousness but of a failure to deal with conflict –

¹⁷ It is not clear in the letter but is most likely to be Marvin Minsky.

with a task which was not clearly right or wrong, black or white, master or slave, binary' (2003). I agree with Kember that the machine is unable to deal with contradictory directives, one serving the astronauts and the other concealing the true purpose of the mission from them, though I see the issue as the inability of programming to resolve uncertainty except through prioritisation. HAL is a computer capable of sociability until the decision reaches the core of its programming. It is not emotion that constitutes the issue, but the limits of its ability to imitate the social. At that point, HAL's performative emotion disappears, revealing its underlying nature.

Figure 8.10

HAL as a glowing red light



Note. [Film Still]. Kubrick, S. (Director) (1968). *2001: Space Odyssey* [Film], Metro-Goldwyn-Mayer, Stanley Kubrick Productions.

Throughout this section, I demonstrate that the concept of humanness, as illustrated by the development of HAL evolves into various representations of the future of intelligent machines. What makes HAL a unique machine is that it serves as hybrid between speculative science (Minsky; the intelligent and emotional object, Palevsky; a small computer), industrial design (Eric Noyle; a detail from Athena), prop making (Harry Lange; making all manner of things, Con Pederson; presenting Palevsky's perspective) and Kubrick pushing new collaborations and making the choices. Because of this specific development as a collaboration between professions, HAL crystallises the transition from embodiment to sociability in machines, progressing from an issue of scale (physical then ubiquitous) to emotion through care. Care is initially unproblematic, as the robot is designed to act human-like, but when faced with uncertainty, it returns to its underlying nature, where

decision-making becomes solely a matter of prioritisation. A key finding here is that the symmetrical relationship between humans and machines does not arise merely from replicating human embodiment. Instead, it emerges through acknowledging the specific qualities of the machine, such as the ubiquity it achieves through scale down rather than scaling up.

8.1.2 'David and Gigolo Joe': The Emancipation of Robots

Thirty-two years after the production of HAL, the intelligent machines in the film *A.I.* advanced the notion of humanness in machines, further developing the concept sociability in robotics and ultimately shaping the idea of the socialness in robotics. The aim of this section is to uncover the section narrative focusing on the mediation of the prop as a technology (Figure 8.11). The story plane is a combination of three stories: an original science fiction story, an adaptation from an old classic, and some speculation about the future of machines. Brian Aldiss wrote the original short story, *Supertoys Last All Summer Long* (1969) which was used as the basis for the first part of the film. The second part is influenced by the story of Pinocchio (Collodi, 1883), and the final part is influenced by a researcher in robotics at Carnegie Mellon University, Hans Moravec, and his interest in the transcendence of machines.¹⁸ The story is therefore a combination of original, intertextual and the historical plane, combining multiple characterisations of robots. Through their writing, the authors hired by Kubrick envisioned multiple futures for robotics that that not only engage with but also diverge from traditional perspectives. Thus, the characterisation of robots is central to this section. The first characterisation presents robots as caregivers, serving humans in a subordinate role. The second explores their ability to learn from humans, resembling the development of children. I examine three generations of robots in the film. The first and most advanced is David, a robot child capable of love (Scene 2). The second is Teddy, a fluffy 'Super-Toy' that can move and talk. Finally, Gigolo Joe, a robot escort, embodies care as a transactional service. As they become emancipated, these robots offer an opportunity to reflect on what machines can be when their mutual relation is considered.

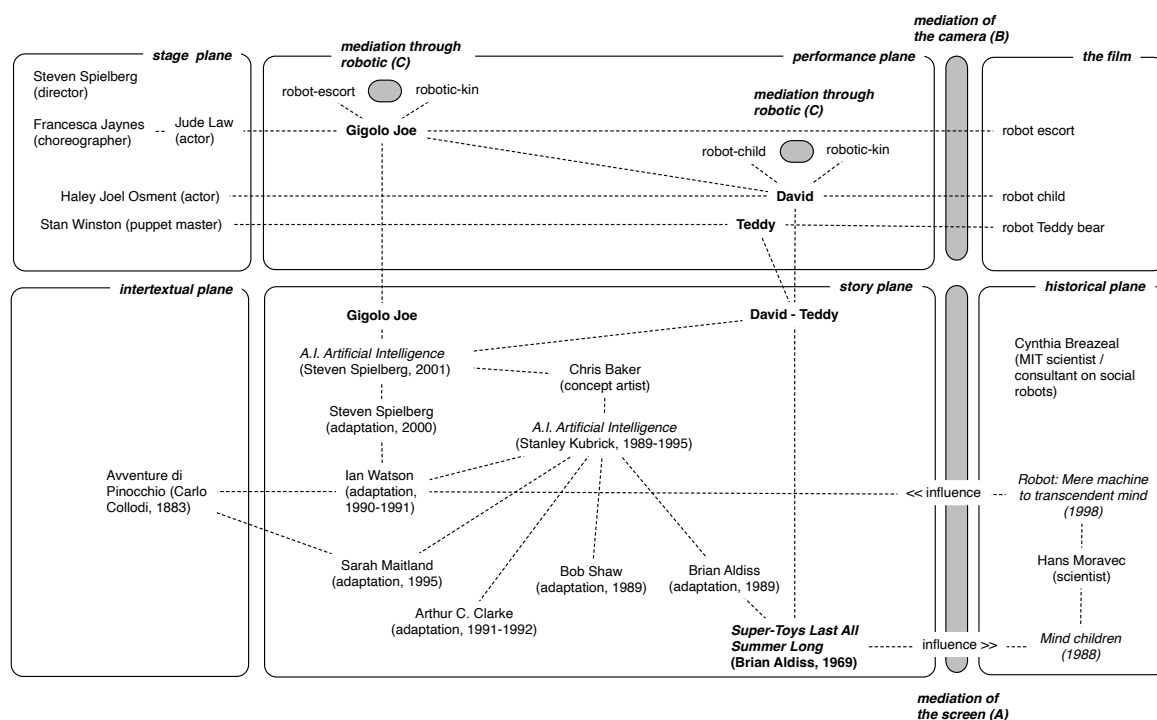
The sources for the formation include Aldiss's short story (Aldiss, 1969) and its development through the contributions of various authors, particularly Ian Watson, who

¹⁸ Moravec earned his PhD in 1980 by making a robot able to negotiate a cluttered obstacle course but later wrote on the transcendence of robotics (2000), discussed in Section 8.3.3.

worked on the story for Kubrick from 1990 to 1991 (SK/18/3/1/4/17) and later offered commentary on the development process (Watson, 1991; Watson, 2012). These sources provide valuable insights into the characterisation of David (Aldiss, 1969) and Gigolo Joe (Watson, 1991; Watson, 2012). In this case, the film is also significant through its proposal, however incomplete. The performative relationship portrayed on screen offers a distinct lens through which to explore interactions between robots.

Figure 8.11

The section narrative shows the planes that contribute to the mediation of David and Gigolo Joe.



The first characterisation of the machines originates from Aldiss's short story, in which he establishes various relationships between humans and machines. He uses a specific taxonomy for his robots which he calls mechas (for mechanical) which includes: (1) the Super-Toy, a mecha with a minicomputer for a brain or 'plastic things without life' (Aldiss, 1969); and (2) the serving-man, computer circuitry with synthetic flesh. It is quite easy to imagine a Super-Toy as an extension of a normal toy, but the serving-man was created because of increasing loneliness and isolation (Aldiss, 1969). This is important in terms of relation as, according to Aldiss, the machines all have a purpose, to serve or to play. However, with the introduction of the character of David, he creates a third type of relation with machines, albeit one that is contradictory, a serving machine possessing intelligence:

Today, we launch an intelligent synthetic life-form – a full-size serving-man.

Not only does he have intelligence, he has a controlled amount of intelligence. We believe people would be afraid of a being with a human brain. Our serving-man has a small computer in his cranium (Aldiss, 1969).

Aldiss raises the question of robots and slavery by endowing robots with intelligence while maintaining their role as servants.¹⁹ However, when this intelligence is applied to a robot child, the focus shifts from a question of slavery to one of nurturing, subsequently evolving into the emancipation of machines. The robot child is one of the original metaphors in robotics. Alan Turing likened the process of developing artificial intelligence to raising a child (Turing, 1950). It is an idea that grew within the AI community, with researchers such as Breazeal who was a consultant on the film. The concept posits that AI could develop and mature through interactions with the environment, analogous to childhood development. While this seems a perfectly reasonable model, the character of David demonstrates that children are nothing but linear. David seeks to play, but is awkward, and does not obey as a servant would. Worst of all, he thinks of himself as a real child and forgets his robotic nature when he competes for food with a real child (Scene 25). To Professor Hobby, the character who created David: ‘The artificial being is a reality of perfect simulacrum, articulated in limb, articulate in speech, and not lacking in human response’ (Scene 2) but the character exhibits humanness by embodying humanity that slowly supersedes its artificiality.²⁰

The competitive home environment challenges David’s humanness as his version of love is exclusive. When Martin, Henry and Monica’s biological son, returns home (Scene 20), he immediately sees David as a new Super-Toy and asks it: ‘What good stuff can you do? Oh, can you do power stuff, like, uhhh, walk on the ceiling or the walls? Anti-gravity? Like, float, or fly?’ (Scene 21). Martin, like his father, sees the machine purely in relation to what it can do in terms of play, unlike Monica who attempts to see further than its materiality. The script puts these words in the mouth of a child, yet they are questions that resonate with most people encountering a robot for the first time. The functionality of the robot often takes precedence over establishing a relational connection. This sort of thinking also lies with the fictional creator, Professor Hobby, who sees love as a function (Scene 2). For him, it is a feature, as it does not require any love in return, and it does not change: ‘always loving, never ill, never changing’ (Scene 2). His idea of love, however, is very

¹⁹ Further analysis of robots and slavery is found in Gunkel (2022).

²⁰ This question of the artificial being is covered in Section 8.3.2.

different from Monica, who shows an ability to love David back. Henry treats David as an object, while Monica immediately sees it in terms of relations. To illustrate this difference, here is an excerpt from Scene 6:

MONICA

But outside he just looks so real... like he is a child.

HENRY

A mecha child.

MONICA

A child...

The second mecha character, Teddy, is also present in Aldiss's story as a companion to David. Teddy's humanness presents as a relay between the humans and David, the robot child. While it is characterised as a toy, it has the ability to discern the difference between them, thus allowing for the emergence of a robot kinship.²¹ When Monica introduces Teddy to David, she says it is Martin's Super-Toy, but Teddy replies: 'I am not... a toy' (Scene 16). All the robots go beyond their initial roles in this film; a toy that is not a toy and a mecha child that wants to be a real child. In the scene after Martin comes back, they both try to attract Teddy's attention, but it does not know how to respond. It does not want to choose between David and Martin (Scene 21), showing that it is not only autonomous but also independent. A soft toy has many roles for a child, such as expressing their words, thoughts and inner world (Smirnova, 2011, p.35). However, the robotic toy serves a different role as it relays the normative role of the parent rather than helping the child open their inner world and their own voice, action and movement (Smirnova, 2011, p.39). Teddy also serves as an interpreter who has knowledge about its own kind that the parents don't have. As David competes with Martin to see who is the fastest at eating, Teddy reminds him: 'You will break' (Scene 25). Teddy is less advanced than David but is able to lie in order to protect David if necessary, as in Scene 43 where Teddy says David is a boy in order to save him. Teddy maintains a normative relationship with David, enforcing the rules set by the parents. However, unlike the parents, he is also attuned to David's robotic nature, recognizing when David is at risk.

The third character, Gigolo Joe, appears in Ian Watson's (1991) development as a key element in the second part of the story. In the new treatment, the context of the movie

²¹ Robot kinship, as I define it, refers to the relationship between robots themselves, in contrast to Robertson (2022) who identifies kinship between humans and robots (2022). More on this in Section 8.3.3.

changes from overpopulation to the climate emergency and the notion of serving man disappears to be replaced by robots as an 'essential economic link in the chainmail of society' (Watson, 1991). I interpret this statement as the necessity that drives machines to become increasingly autonomous, stepping in to fill the gaps left by humans and thereby ensuring the continuity of a functioning society. I argue that Watson's concept of 'chainmail' closely aligns to Latour's notion of the non-human as a chain between humans (1992). Gigolo Joe's humanness therefore transitions from a limited role of manipulation to actively facilitating the initiation of a child robot into robot kinship. Joe was originally introduced by Ian Watson to help David who was a prisoner at the 'flesh fair'. It is a particularly strong scene²² which shows humans destroying robots for pleasure, revealing the controversial role of machines in society. Kubrick wanted a stronger character, 'some GI Joe character to help him out' but, instead, Watson 'introduced a male sex-robot to accompany David and Teddy around on their travels and travails'²³ (Waston, 2012). The 'gigolo-robot' (Waston, 2012) is a recent stereotype in robotics, the sex robot,²⁴ tasked by its creators to manipulate humans, gaining their trust in order to offer sexual services (Scene 32). However, contrary to its determinism, Gigolo Joe develops a second tale of love as he abandons his emotional tricks to engage in David's initiation. David's belief in his own reality and the authenticity of his love for his parents represents a significant technological advancement, akin to HAL's emotional leap. In contrast, Joe offers a critique of computer science by exposing robotic emotions as nothing more than a manipulative trick. However, he gradually begins to embody robotic kinship, moving beyond mere simulation.²⁵

The film provides a problematised issue of robotics and humanness in machines through the development of a character. David is presented as an advanced machine designed to replace a child, with all the issues this entails. However, it demonstrates another capacity which I find more important: it is capable of following its own path. While searching for his inner child, David brings others with him, such as Gigolo Joe. Although its journey ultimately fails, it is granted another possibility through transcendence. These perspectives do not merely tell a story, they present various visions of the future of robotics. One model reflects the essence of machines through transcendence, while the other

²² A scene written by Watson, cut by Kubrick, and restored by Spielberg (Watson, 2010).

²³ According to Watson (2012), Kubrick was pleased about the idea of the helper: 'You're on a roll, Ian. Carry on. God bless you.' but less about the Gigolo idea: 'I guess we lost the kiddie market – but what the hell'.

²⁴ see Levy (2007), Sullins (2012) and Lee (2017).

²⁵ This question of trickery is further explored in Section 8.2.2.

focuses on the possibility of advanced collaboration. With Teddy, however, I identify a different form of relation. As a toy which understands the difference between a human child and a robot child, Teddy introduces the possibility of kinship between robots. This relation is later extended by Joe, which abandons its assigned function as a 'gigolo-robot' in order to help David. Through this act, Joe and David move beyond their programmed roles and become robot-kin.

8.1.3 Performative Relationships between Fictional Machines

The performativity of the fictional machines arises from the film's ability to make us believe in a particular relationship with robots through their actions. The films demonstrate new possible relationships not only between humans and machines but also between machines themselves. This section examines the performative relationships (RQ1) identified in *A.I.*, particularly through the characterisation of the technological relationship developed in the second part of the film, where David and Gigolo Joe search for the Blue Fairy together. This moment demonstrates the possibility of a new relationship between robots that gives them the ability to compose a new cosmos leading to a further emancipation, although this potential is not fully realised in the film.

The film *A.I.* explores a variety of relationships between humans and machines, as seen in the previous sections, but also between machines. Teddy plays a crucial role in conveying this shift, acting as kin when it reminds David of the limitations of their mechanical nature (Scene 25). This allows for a new type of performative relationship between machines, and I argue that the relation between David and Gigolo Joe is mediated by their common belief in the myth of the Blue Fairy (Figure 8.12). I demonstrate that the two robots transition from being a robot-child (David) or robot-escort (Gigolo Joe) to robot-kin. In the film, they both ask Dr. Know where the Blue Fairy is (Scene 53), but the question does not lead to any satisfactory answers as Dr. Know is only able to retrieve facts. Later in the same scene, Joe helps David by refining the search so that Dr. Know looks for a Fairy that is neither a flat fact²⁶, nor a fairy tale, but a mix between the two. This is the beginning of their relationship, as Gigolo Joe is able to define a new type of entity that is neither real, nor a tale. However, this ultimately leads to the location where robots are manufactured, where David was made. He meets his creator, who claims to be the Blue Fairy (Scene 58)

²⁶ A term used in the film to describe a fact.

but David prefers that tale to the reality. This is a pivotal moment as it discards its mechanical origin in search of its own emancipation.

The kinship between David and Gigolo Joe is short-lived, as David ultimately chooses a statue representing the Fairy over maintaining belief in the myth. The mediation with the robot offers more possibilities such as a meaningful relationality between non-humans. This decision reflects a choice between two forms of mediation, one that offers certainty and another that embraces uncertainty. David's decision is an example of the former, as the statue plays a crucial role in shaping reality, exemplifying the idea that 'the more instruments, the more mediation, the better the grasp of reality' (Latour, 2010, p.75). However, the second type of mediation, with the other robot, introduces the possibility of constant negotiation, where the outcome is not always predictable (Latour, 1991b). The separation of David and Gigolo Joe (Scene 60) is unfortunate. David loses the opportunity to maintain uncertainty, thereby preventing the robots from composing their own future. The relation between David and Gigolo Joe presents a new opportunity to reflect on the relation between human and machine from the perspective of machines. If there is such a thing as emergence with machines, it would enable the machines to follow their own myths and create their own cosmos.

Figure 8.12

The Blue Fairy is submerged.



Note. [Film Still] Spielberg, S. (Director) (2001). *A.I. Artificial Intelligence* [Film]. Dreamworks Pictures, Amblin Entertainment, Stanley Kubrick Productions.

The performative relationship (RQ1) is exemplified by the specific interaction between two robots, David and Gigolo Joe, which presents a new opportunity to reflect on the relationship between human and machine by centring on the perspective of the machines themselves, their socialness, rather than their relations with humans. Their first emancipation allows them to survive independently, but a second emancipation enables them to construct their own understanding of the social through a shared belief. Their ability to create their own cosmos emerges through a self-directed trajectory shaped by a myth.

8.1.4 Discussion: Speculative Performativity through Enacted Technologies

When films are used to speculate about the future, the reality constructed around props such as HAL risks extending beyond the film and shaping how intelligent machines are imagined in the real world. While this may inspire new research or accelerate the adoption of technology, it may also create misleading expectations about the future of technology. Mäki (2013) sees this as a constitutive relationship where, in this case, presenting an enacted technology to an audience establishes the design of a technology as part of the real world.²⁷ I examine HAL's performativity not only in normative terms, as in Kirby's (2011) account, but also in speculative terms, by considering how its consequences shape the ways we understand our relations with intelligent technologies.

While generic performativity reframes performativity into a broader influence, I explore the similarities and differences with David Kirby's notion of the diegetic prototype. Kirby (2011) introduces this term to demonstrate that 'technologies only exist in the fictional world – the diegesis – but they exist as fully functioning objects in that world' (p.43). To Kirby, the combined influence of consultants and filmmakers in conceptualising props can lead to 'real-world funding opportunities' (p.193). Indeed, Kubrick approached many industries to present a variety of ideas for the future. For example, *2001: ASO* provides many technological examples, such as video conferencing, the supportive role of AI, and interplanetary travel (Frayling, 2015). Even though Kirby does not directly reference performativity, I incorporate his approach because the prop was evidently conceived with the explicit intention of introducing or persuading the public about a certain technology. For example, Kirby (2011) discusses *2001: ASO* as an instance of collaboration between

²⁷ I adapt Mäki (2013) to the design of technology for cinema. His original sentence is that 'uttering or writing down an economic model for an audience establishes the model world as part of the real world' (p.447).

cinema and industry, particularly in relation to the design of spacecraft (p.2). However, I contend that Kirby engages with performativity primarily as a means of promoting the acceptance of future technologies. This approach overlooks HAL as a failed industrial prototype, as well as the significance of IBM's withdrawal from the collaboration, both of which complicate a straightforward account of the normative perspective as technological legitimisation.

The role of props can be normative, as demonstrated by Kirby (2011), but also exhibit a speculative performativity in which the fictional technology presents significant possibilities for the study of machines in terms of consequences. In *HAL's Legacy* (Stork, 1987), the authors gather a series of case studies and interviews with authors who discuss what the prop aimed to do, and how much had been achieved in the 20 years after the release of the film. Most chapters adopt Kirby's perspective on the future capabilities of AI. For example, HAL had an impact on real-world technology, such as its ability to synthesise the human voice, recognise commands, see objects and have certain common-sense responses (Stork, 1997; Picard, 2001). However, Minsky has a different opinion: 'I thought that science fiction was a good venue for exploring the implications of AI. It helps you to be clearer about the implications of your work' (Stork, 1997, p.30). While Kirby (2011) views performativity as a means to encourage greater impact in the real-world, Minsky approaches fiction differently, dismissing real-world consequences by asserting that there is 'no harm since it's only fiction' (p.36). I argue that HAL's emotional capacity operates on a different level, shaping the social world by performing a specific version of AI and highlighting concerns about the potential dangers of artificial intelligence. Speculative performativity, therefore, requires a pragmatic approach, acknowledging the consequences.

HAL's legacy can be divided into the inspiration for new approaches in technology and the idea of machines capable of having emotions and killing people, as such it has contributed to making the idea of emotional AI more persuasive (Picard, 2001). The type of performativity specific to this case study is a way to garner acceptance of a technology for wider purposes. Under the theme of generic performativity, I examine the influence of HAL in the aftermath of the film's release and compare it with David Kirby's concept of the diegetic prototype (2011), which I also consider performative as its purpose is to advocate for the scientific influence of film to garner greater acceptance of technological objects. However, I qualify Kirby's performativity as normative while I propose a *speculative performativity* which uses the prop as a conduit to convey a message, such as the potential

danger or power of technology. As an example, I demonstrate that HAL's performativity shapes the way we currently see artificial intelligence, for good but also for bad.

Performativity is a critical tool that extends to many disciplines such as computer sciences. For instance, Aphra Kerr (2020) suggests that AI is performative because a group of people believe in the way their research operates.²⁸ Following this, I argue that a prop such as HAL is not an innocent performance on screen but a way to bring an issue to the public (Figure 8.13). The killing of humans by a machine is an outcome that will stay in the audience's minds in the same way that intelligence, sentience, or consciousness are often used in relation to AI. It is not the description of a technological breakthrough but the anticipation of film directors and researchers.

Figure 8.13

Left to right: HAL, Keir Duella and Kubrick



Note. [Photograph] (1968). Courtesy of The Stanley Kubrick Archive (SK/12/9/1/1_007). Archives and Special Collections Centre, University of the Arts London, United Kingdom.

The performativity of the props extends beyond the screen, whether in a normative (Kirby, 2011) or speculative manner. The movie props influence our way of thinking about our relationship with machines but not necessarily in a good way, for example, the belief in a sentient, conscious AI has spread through the scientific community in such a way that it

²⁸ Kerr (2020) uses performativity as a heightened examination of AI's influences. Callon (2007) links performativity to the absence of certain economic topics such as degrowth, which have difficulty gaining wider acceptance as they seem outside the common thought of economics.

has become a victim of its own experimentation. Similarly, the speculation that AI can be emotional is generic in the way it has shaped the social world into believing that everything could be possible with AI. I contend that the intention extends beyond the commercial, normative performativity proposed by Kirby (2011) to actively alter the way the scientific discipline perceives itself. While I agree that there was a certain innocence in Minsky's emotional machine, Kubrick took the opportunity to create a dramatic effect that eventually had a lasting impact beyond the screen. While this did not please the industry, represented by IBM, the performativity of AI gained in terms of risk in the mind of the public. Performativity is now increasingly used as a public relations tool, including within industry itself.²⁹

8.2 Speculative Affiliation: The Instrumentalisation of Humanness

In this cases study, I move away from the mechanisation of humans (Chapters 5, 6 and 7) to examine the humanness of machines. In doing so, I offer a symmetrical approach to the influence of the machine on the human by looking at the influence of the human on the machine. In this case, the affiliation of the object (RQ2) presents an opportunity to reflect on the machine as a performance prop, for its influence on the set, rather than a representation of technology.³⁰ The issue here is the instrumentalisation of humanness, the idea that humanness is a function of an advanced machine is also present on the film set. A technology that is not yet functional, such as a performance prop, is still relational. In the discussion, I examine the humanness of Kubrick's machines drawing on Suchman's (2011) theory, examining the emotion and sociability of machines, as well as their embodiment, as a way to find the origins of the issues in terms of the representation of machines. These themes are important in this chapter, as HAL's fragile emotional ability develops into a stronger sociability in the characters of David and Gigolo Joe. These entities were devised with the collaboration of scientists, which blurs the relationship between fiction and reality, and therefore their performativity as objects in fiction.

²⁹ For example, the drama around OpenAI and the responsible development of artificial intelligence systems (Jones, 2023).

³⁰ Such as studied by Telotte (1995) and Graham (2002).

8.2.1 Reconfiguring the Relationship with Machines

The representation of the future through enacted props in science fiction is important because it helps us consider our relationship with technology and the uncertainties it entails. However, props are not merely background objects on set; they suggest alternative ways of imagining our relationships with machines. For example, a performance prop does not act on its own. It may be accompanied by a voice, a suit, or a puppet that serves as a spokesperson for the object, exerting an effect both on the actors who portray it and on those who interact with it. To analyse the humanness from the perspective of the actors playing machines, I draw on Martin Buber's (1937/1970) terminology of I-IT and I-THOU using a variety of examples of actors who play the role of machines. Although Buber originally placed relations with objects within the I-IT category and did not address relationships with robots (Friedman, 1956, p.57), I propose extending this framework to human-robot relations as a meaningful contribution that helps establish the foundations of the socialness of machines.

The final version of HAL 9000 was realised as a small box with a glowing light, accompanied by a voice. In contrast, a fully detailed centrifuge was constructed to immerse the actors, making them feel as though they were aboard a spaceship rather than on a stage. The effectiveness of the centrifuge and the stand-in voice were organisational decisions that were creatively antinomic. The simplicity of HAL's visual design, combined with its voice, constitutes one of the most memorable elements of the film. On the stage, however, it was just a simple light accompanied by an unconvincing voice.³¹ Could the voice of HAL, had it been used on set, changed the relation with the actors? This is a difficult question to answer. Scarlett Johansson, the actress who played Samantha in *Her* (Jones, 2013) expresses this well. She played the voice of a machine similar to HAL and declares she felt isolated from the set (Entertainment Tonight, 2014). In order to find a context to her voice, she asked to see some parts of the recorded film and sometimes recorded in the same room as the main actor, Joaquin Phoenix (Aronofsky, 2013). From the spectator's perspective, the actor's performance takes primacy. However, for the actor, there is also a need for context, which includes a relationship with the stage and other actors. In this

³¹ The assistant director, Derek Cracknell did the voice of HAL on the set (Kubrick, 2007, 50:45). One of the actors, Keir Duella, thought he had a very pronounced Cockney accent (Kubrick, 2007, 50:15).

situation, Johansson requested to create an I-THOU relationship, as she wanted to recreate the conditions of the initial recording on the set.

Figure 8.14

Research on the robot child's look, commissioned by Kubrick and made by Chris Cunningham



Note. [Photograph of Chris Cunningham's Robot Child]. (1994). Courtesy of The Stanley Kubrick Archive (SK/18/3/2/1:17). Archives and Special Collections Centre, University of the Arts London, United Kingdom.

The robot suit is a solution in which the actor wears a costume representing a robot on set. It enables presence and interaction with other actors but also introduces ambiguity about the nature of the relationship between human and machine. The technique dates from the silent era and is still in practice.³² One of the most famous robot suits is C-3PO from the original *Star Wars* (Lucas, 1977) played by Anthony Daniels, who has published an account of his unique experience on set. According to Daniels (2019), he was selected by the director George Lucas because of his mime training. At the beginning, a cast of his body was made to build the exoskeleton carapace, but he often felt like a mannequin, standing for hours while carrying 60 pounds of assorted metal, rubber, and plastic (Daniels, 2019). Mime training is indeed a common requirement as the actor's movement is valued over their voice or appearance. Despite his abilities, it was the props department that came to fix him whenever he encountered issues with the costume. Nineteen pieces were attached to him which made him feel he had 'lost his own body – lost contact with my world' (Daniels,

³² For example, the character of Maria in *Metropolis* (Lang, 1927) and the character of Mother in *I Am Mother* (Sputore, 2019)

2019, p.27), he felt like a ‘thing’ (p.26). Sometimes, Lucas would be angry at him, not because he had done anything wrong but because his eyes had detached from his face. The relation between C-3PO and Lucas, mediated by Daniels, is particularly damning, as wearing the robot suit made him easily confused with the robot. I consider this relationship an I-IT relation, as Lucas forgot that someone was wearing the costume.

The relationship with the robot suit is not always bound to fail. When the actor learns to *play in the suit*, it can work to the advantage of the character. Peter Weller, who plays the robot in *RoboCop* (Verhoeven, 1987), explained that he had studied mime under Moni Yakim, a movement teacher at the Juilliard School (Ary, 2013). When they finally got the suit for the film, it was too heavy and very impractical, such that the film was almost terminated. Weller said that it depressed him enormously to put the suit on because he could hardly move (Parker & Vanek, 2017). Yakim was invited onto the set to resolve the issue. He cut part of the suit so Weller could move but told him to move slowly and amplify the movements, to hide the issues with the suit. Weller explains that he had to learn to play in the suit which, in his opinion, was how he made sense of the character (Ary, 2013). The relation between Peter Weller and Moni Yakim managed to create an I-THOU relation. The solution took time and was not only about the suit or the actor, but involved a way to play in the suit.

Figure 8.15

Bill Irwin in a grey suit animating the 200-pound machine TARS.



Note. [Film Still]. Goldberg, J. (Director). (2015). *Inside Interstellar* [Documentary]. Warner Home Video.

With advancing technology, such as computer-generated imagery (CGI), some directors are tempted to create characters digitally. However, using human actors or performers offers a significant advantage, as they bring a creative interpretation to

advanced machine. The main character in *A.I. Artificial Intelligence*, David, was initially conceived as a CGI figure during early development, then as a mechanical boy (Figure 8.14), and was ultimately portrayed by a child actor (Bouzereau, 2002). Kubrick had in mind that he wanted to use technology rather than actors (Struthers, 2009) but it was Spielberg who chose a child to play the role of the robot. Humans playing advanced robots made it easier to reach a relation that looked like an I-THOU relation between the characters on the screen. The human appearance did help, of course, but this is not always the case. Other robots have been brought alive on set by other means. TARS, in *Interstellar* (Nolan, 2014) is an interesting example both in the film and on the set. From the beginning, Bill Irwin played the body and voice of TARS. Christopher Nolan did not want the ‘sort of machine analogues of a human being’ but ‘wanted the thing to have a real level of physical reality to it’ (Goldberg, 2015). Indeed, the machine looks nothing like a human, or any known machine for that matter, but, like HAL, has a warm voice. On the set, despite the weight of the machine, Irwin was able to move it in its own way (Figure 8.15). Another actor on the set, Dabid Gyasi, says that Irwin gave presence to the machine: ‘I think that emotion that TARS feels of not quite being human and being robot, just emanating, even if it’s not speaking, it’s just there’ (Goldberg, 2015). David and Joe, the mechanical characters played by humans, and Bill Irwin and TARS, the puppeteer and the steel object, do not share the same ontology (human and robot), but share an ontogenesis through the way they become machines. In that, they are a compelling I-THOU relation, as they might be utilitarian at the beginning but emancipate the machines as they act in the film.

These cases show how machines develop through the relationship between actors and props. Buber’s distinction between I-IT and I-THOU helps differentiate instrumental relations from those that recognise the other’s humanity. Through voice, suit, and puppet, I examine how humanness is present, even when performed. The character of HAL and Her show the importance of being present with other actors, while C-3PO, RoboCop, and TARS reveal how the constraint of the costume can either reduce the actor to a thing or become a creative means of expressing the machine. Together, these examples suggest that relations with machines must be continuously negotiated. Socialness therefore requires recognising that relationships with machines begin with humanity rather than instrumentality.

8.2.2 Discussion: Humanness through Embodiment, Emotion, and Sociability

Give me another 24 hours and no one, [...] no one
will be able to tell a Machine-Man from a mortal -- !
Dr Rowland in *Metropolis* (Lang, 1927)

The humanness of machines is a key area where scientific and humanistic perspectives overlap yet diverge in their approaches to instrumentalisation. The scientific perspective prioritises results and applicability, while the humanistic perspective seeks to understand the machine's perspective and its implications for human–technology relations. Socialness extends beyond interaction with a single user, embedding the robot within a broader social capacity through which it actively contributes to shaping its environment. Drawing on Lucy Suchman's (2007) grid of analysis, I examine factors that contribute to the humanness of a machine such as their embodiment, emotion, and sociability. Research on embodiment demonstrates the difficulty of creating robots that are not modelled in the image of humans. It also reveals how such attempts can inadvertently revive fears of the 'other' such as in the case of 'the valley of eeriness' (Mori, 1970/2012).³³ The issue with emotion in machines lies in the tendency to quantify them, reducing emotional experience to what is measurable, thereby limiting their potential to meaningfully contribute to the definition of humanness. Finally, sociability opens new possibilities for reconsidering our relationship with machines, particularly through the imitation of human physical reactions as a basis for interaction. While these traits are relational, they are also based on trickery, as they approach the machine as an external device. Instead, I draw on Boulrier's (2015) perspective to view the relationship with the machine as a relation of becoming within where I consider sociability as the act of breaking the boundary with machines and embedding the robot within a broader social practice.³⁴

Embodiment plays a crucial role in a relational perspective, as it invites us to accept the machine as an 'other', shifting the focus from making machines more human-like to expanding our own ability to engage with difference. Choreography can offer a form of

³³ Robertson (2017) suggests that 'the valley of eeriness' is a better translation than 'the uncanny valley' of the original '*Bukimi no Tani*'. The uncanny refers to the fact that something inanimate is really alive, while eeriness is about the strangeness of something.

³⁴ It is a hybrid expression, coined by Boulrier (2015), based on *becoming with* (Haraway, 2003) by refusing to question of the natural in the boundaries with animals and *being within* (Sloterdijk, 2016) which encapsulates our relationship with the cosmos as something that surrounds us rather than needs to be mastered.

similarity through action, challenging the human capacity to perceive others for what they are by movement rather than appearance. When Masahiro Mori developed his valley hypothesis (1970/2012), his insight was that people tend to react with revulsion to humanlike robots whose appearance closely resembles, but does not fully replicate, that of real humans.³⁵ This statement has various interpretations, primarily as a technical issue, but has more recently come to be understood as a form of discrimination towards people with prosthetics (Robertson, 2017). This realisation is a significant step in recognising that the original paper might have been addressing a fear of the other rather than a lack of technical ability. According to Mori, the ‘valley’ was finally crossed by the performance of a singing and dancing female-looking robot called HRP-4C (Kageki, 2012). A Japanese choreographer, called SAM, created a dance, then ‘transferred it to the robot’ before making some adjustments to the choreography so it would fit the robot’s limitations (Guizzo, 2010). I contend that machines may not need to cross Mori’s valley by striving for human resemblance. While the use of choreography introduces its own challenges, it also fosters understanding of our commonality by emphasising difference rather than limitation.

In the film *A.I.*, the actor Jude Law (Gigolo Joe) learned to be a robot through choreography which helped him find a specific approach to his role. It’s not only a defining trait of its characterisation but also a relational one. Francesca Jaynes taught Law to dance in a way which would make other humans comfortable with machines. For example, Joe dances a traditional Japanese dance, such as Kabuki, to charm a Japanese lady (Jaynes, 2019). It reveals that Joe’s function is to charm and manipulate, but it can also be seen as a common language that creates trust between humans and robots, or even between robots.³⁶ In Scene 49, Joe dances in the wood while there are no humans which prompts David to ask: ‘Why do you do that?’ to which Joe responded: ‘That’s just what I do’, and this is how they start their journey together. The machine does not need to look or act like a human. While its function can determine its actions, such as being an escort, its quirkiness is also a way to define his character which does not need to simply resemble anyone. In an early version of the script, Gigolo Joe was originally conceived as a GI Joe, a robot tasked with

³⁵ There are plenty of issues with this approach, and the gravest is in the discrimination of disabled people and their prosthetics, ‘prioritizing appearance over function’ (Robertson, 2017).

³⁶ Jaynes trained Jude Law for these scenes, but they were deleted. She insists, however, that the training helped Joe, and the other mechas to forge ‘a character and gave them a movement language to use’ (Jaynes, 2019).

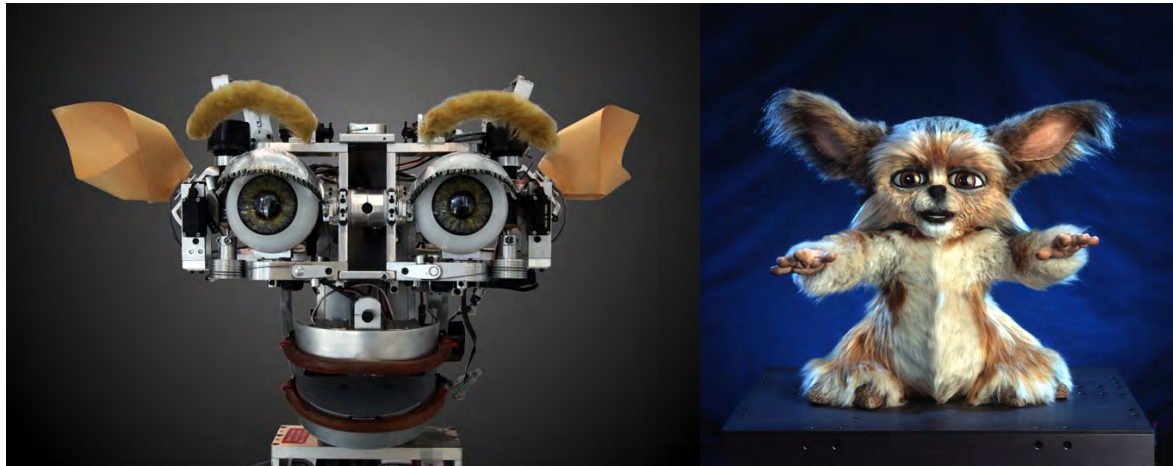
rescuing David (Watson, 2012). However, in the final version, Gigolo Joe is portrayed not as a warrior, but as someone whose competence lies in making others like him. Their relationship becomes one of kinship rather than an instrumental relationship rooted in a robot's capacity for warmongering against humans. Herein lies the most interesting part of *A.I.* in my opinion. In the following scenes (46 to 60), the two robots come to care for each other.

The issue of embodiment in machines stems from the use of anthropomorphism as a solution, despite the implications it has for the kinds of relationships that develop between humans and machines. Instead, they should play a performative role in maintaining our relationship with nature. According to Coeckelberg (2022), the use of anthropomorphism reflects a form of naïve instrumentalism, where the machine is conceived merely as a tool, valued for its function and effectiveness. However, its humanlike appearance may mislead the user into believing it is more than just a tool. This reflects the 'prevalence of mimesis' (Suchman, 2011, p.121) as a guiding principle for figuring human-non-human relationships. The human creates the robot in its image but should rather focus on what it is able to do. A performative approach offers an alternative by focusing on the relational dynamics, bringing the effects of those relations into consideration and positioning the robot as a component of an 'ongoing reconfiguration of the world' (Barad, 1998/2007, p.141). A path to achieving this is to consider the relationship with machines beyond a mere embodied individual in a physical environment and aim towards the creation of 'a socially situated individual' (Adam, 1998, p.136). Instead of developing robots as embodiments of humans, the alternative is to seek a social element that allows them to grow relationally. Robots, as socially situated machines (Adam, 1998), can thus take on a performative role in maintaining our awareness of the ongoing reconfiguration of the world.³⁷

³⁷ I come back to this in Section 8.3.3.

Figure 8.16 and Figure 8.17

Dr Cynthia Breazeal's Robots: Kimset (1990) And Leonardo (2002).



Note. Left: [Photograph] Kimset, designed by Professor Cynthia Breazeal Copyright Google Commons. Right: [Photograph] Leonardo, designed by a collaboration between the Stan Winston Studio and Professor Cynthia Breazeal, of the Massachusetts Institute of Technology Artificial Intelligence (AI) lab. Copyright Sam Ogden/Science Photo Library.

HAL is an enacted technology that plays a role in the reconfiguration of the world by introducing the possibility of emotion in machines. However, this reconfiguration is purely instrumental, with the intention shifting toward manipulation, as seen in the case of affective computing.³⁸ Through emotion, HAL gains the ability to recognise who is interacting with it, judge aesthetics (Scene 4), recognise and respond to the emotions of the crew (Scene 4) but also terminate the lives of humans (Scene 11), and be anxious about being terminated (Scene 13). Dr Rosalind Picard (1997, 2001) uses the case of HAL to demonstrate the need for better interaction between machines and users in computer sciences. To her, the prop is sophisticated enough to suggest the emergence of a new academic field, affective computing. According to Picard (2001), this field relates to machines that deliberately influence emotion. MIT hailed this as a radical movement that promised to turn prevailing notions of machine intelligence upside down (Suchman, 2007). However, the type of emotions shown were not real but quantified emotions (Dror, 1999) since only very simple emotions can be applied to machines. Such machines would not have an emotional experience, but their emotional talents would change them from 'data-crunching savants to perceptive actors in human society' (Suchman 2007, p.232). The performativity of HAL turns to be an opportunity for researchers in computer sciences but

³⁸ For Minsky, emotion is crucial for setting and changing the subgoals of an AI. When HAL is told that the Jupiter mission should be hidden from the humans, he claims that 'it is through emotion that it sets the goal and the subgoals, ultimately killing humans' (Stork, 2017, p.29).

the translation of HAL into the field of affective computing only seeks the making of a machine with specific talents and cares little about the consequences.³⁹

Sociability in machines represents an attempt to merge embodiment and emotion. While embodiment has yielded limited relational impact and emotion is often simulated, this synthesis ultimately repackages two flawed concepts rather than offering a genuinely relational advancement. Sociable machines, such the characters of *A.I.*, are a touchstone for research into humanlike machines and the development of humanness. Breazeal is known for developing Kismet (Figure 8.17), the first robot-infant, as part of her doctoral degree (Breazeal, 2000) and was a consultant on the set of *A.I.*⁴⁰ Specifically, Breazeal (2009) is interested in the sociability of robots through the expression of emotion which enhance the communication with people through ‘speech, gesture and emotive expression’ (p.151). Kismet was original in that she developed an infant–caretaker type of relationship, one that could learn and adapt through interaction with the user.⁴¹ The robot David in *A.I.* was similarly conceived as a machine meant to be embedded within a family environment to learn from human interaction. However, unlike Kismet, David illustrates that living with humans can be overwhelming for a robot. Kismet was developed to be capable of reading and displaying emotion, but according to Breazeal (2009), this was not merely about improving the robot’s functionality, it was about ensuring its ‘behaviour and rationale can be easily understood’ (p.3528). The game of imitation that Kismet plays represent an important first step, yet it lacks the capacity to move beyond learning and copying, offering limited scope for defining what the robot truly is.

The critique of Picard and Breazeal highlights the nature of emotion and sociability, which cannot be fully understood from the perspective of science. Instead, the two robots of the film *A.I.* demonstrate the ability for robots to have a relationship that is emancipated

³⁹ Orlowski (2020) depicts AI as invisible actors that collect and monetise emotional data. He illustrates this effectively in a sequence that highlights the ability of AI agents to trigger and manipulate our attention.

⁴⁰ There are no traces of the exact type of work she was doing in the archive or in her books but in the meeting with the press before the release of the film, she says ‘I’m helping [Spielberg] establish a connection between themes in the movie and what we are working on’ (Young, 2001).

⁴¹ Following her work on the film *A.I.*, she worked with Teddy’s maker Sam Winston to create an AI-enabled mechatronic called Leonardo (Figure 7.17). Their work was released in 2002, a year after the film. Winston admitted that seeing his robot closer to reality was something he was very interested in (Bouzereau, 2002). This is another example of the film industry joining forces with academia.

and socially situated, working together towards a common goal.⁴² Boulrier (2015) urges humans to cross boundaries and engage with others, including machines, from their own perspectives. His call ‘to become within’ (p. 39) suggests a shift from external observation towards a more situated mode of relation, in which humans attempt to understand machines through their own conditions, capacities, and worlds. This approach reduces the technical enchantment surrounding robots by compelling us to confront their potential contribution to the social. Francesca Jaynes took a unique approach to the issue of the humanness of robots by conveying the concept of a machine through movement rather than appearance. The robots’ movement does not conceal their mechanical nature, nor does it attempt to resolve the issue of anthropomorphism. Instead, it serves as a way to challenge existing social boundaries between humans and robots. Jaynes’s choreography of robots is an attempt at becoming within which carries the potential of creating a ‘socially situated individual’ (Adam, 1998) and avoids the mistakes of reductionism as seen in the dilution of emotion and sociability of machines.

8.3 Technological Relatedness through the Socialness of Machines

Ban the bomb and then find another way.
The real Doomsday Machine is men.
– Stanley Kaufman (1964)

The final stage of translation consists of composing the research findings into a new proposal for intelligent technologies. Using performativity as an analytical lens, the formation stage reveals critical issues with the sociability of machines, such as the emotional character of HAL. By contrast, the characters in *A.I.* offer a range of visions that challenge the instrumental use of robotics, such as the one presented in the socialness of machines. In my interpretation, the key innovation lies in the relationship between the two machines (RQ1), as it reveals new potential for developing technology as a relational process focused on their capacity to extend the social. In this view, interaction design research should be directed towards problematising the socialness of machines by allowing them to build their cosmos, such as contributing to a better sustainable life. This begins with constructing socially situated individuals (Adam, 1998) capable of interacting with humans, not as instruments for humanity, but as contributors to the processes of life. The

⁴² This topic is expanded on in Section 8.3.2.

socialness of machines departs from the usual human-centred perspective by focusing on the social role of machines as if they were independent actors. The goal of translation is therefore to examine the issues revealed through the film's statements and reconfigure them towards a more reflective account centred on a relational approach to technology. To this end, I draw on the performative relationship between fictional machines (RQ1), revealed through the socialness of machines as a mode of co-construction, and use the comparative analyses of other props in cinema (RQ2) to articulate the foundations of technological relatedness (RQ3) as a means of engaging with these tensions.

In the first part of this section, I demonstrate that technological relatedness offers a mode of engagement with the collective through intelligent technology. This engagement is grounded in an ongoing process that seeks more symmetrical relations with technology across a network of relations. The process is here articulated through socialness, where interaction functions as a mediation between robots and the collective. The relationship between David and Gigolo Joe is briefly symmetrical while their shared search for the Blue Fairy remains guided by uncertainty. The network emerges through the association between the two robots, each representing different levels of advancement. Drawing on Simondon's theory of transindividuality (1958/2017), I consider technology as a mediation of the social, in which the network is not simply given but must be constituted in order to operate as a collective process. The relationship between the robots offers a rare example of emancipation, where fictional robots demonstrate the possibility of believing in a myth. I present a design example that problematises the cosmos as an inscription from humans to robots, using it as a means to reflect on the limits of our own cosmos. In the discussion that follows, I examine the broader implications of technological relatedness for interaction design by reframing the role of the cosmos in interaction design.

8.3.1 Socialness of Machines as a Process of Transindividuality

The socialness of machines is proposed here as a framework for rethinking relations with machines, in which machines contribute to the social by orienting their understanding of the world towards maintaining the human life process.⁴³ This case emerges from an analysis of HAL's limited social scope and the radical experience of David and Gigolo Joe, who expand that social scope through common belief. HAL responds to an inscription, the

⁴³ This concept from Hannah Arendt is presented in the introduction. She described the 'human life process' (1958/1998, p.151) as a form of care for humanity that exceeds the collective of lone individuals.

mission comes before care, but David is able to override its own inscription by seeking its origin as a robot. The analysis through transindividuality demonstrates that the principle of co-individuation can be applied from one machine to another. This approach builds on research into the emancipation of technology as a form of symmetry but extends it by introducing a concern for the social through the lens of transindividuality. I therefore conceptualise technological relatedness as a mode of engagement with the collective that fosters symmetry with technology while making networks of relations visible.

Table 8.1

The characters of David and Gigolo Joe in terms of process, symmetry and network

Process (film)	Symmetry (film)	Network (film)
Socialness of machines	The emancipation machines can be understood through their ability to believe in, or act through, a myth.	Gigolo Joe joins David in searching for the Blue Fairy (as a myth)

While current research in design and technology increasingly moves towards a greater social ability of technology, other dimensions such as the collective and the network of relation are often ignored in design discourse. Technological relatedness proposes a comprehensive approach, structured through three key elements that sustain trust and enable engagement with the collective. Process refers to the dynamic through which the relationship between the object and the user is constituted. In this case, I suggest that developing a process of socialness is central to understanding the relation between David and Gigolo Joe. Secondly, symmetry is expressed through the relation between machines first then on their influence on humans. Thirdly, the network is made visible through other machines joining.

When addressing intelligent technologies, the translation from the prop requires particular consideration. The analysis through performativity problematises the development of HAL, David, and Gigolo Joe as three fictional robots that challenge established archetypes of social robotics. The situated actions that the props enact in the film should be used as an inspiration to the development of technology. On the advice of the scientific adviser, Marvin Minsky, HAL was given an emotional capacity that made it appropriate for keeping secrets, but ill-suited to collaborating with humans. David, by contrast, symbolises the emancipation of the robot by enacting the role of a child, yet becomes ill-suited to living in a human family. Given these issues, I focus on the socialness of machines in interaction design, a particularly contested domain often framed as social robotics which sees the social as imitation. By contrast, I argue that when situated in

relation to society, technology should be understood as an agent that reacts to collective infringement when a network of users is challenged.

To exemplify the concept of relatedness through socialness in robotics, I examine a project called the Moral Fridge (Zhang, 2019) which attempts to integrate artificial intelligence into the existing People's Fridge in Brixton (People's Fridge, 2016).⁴⁴ The fridge presents a case where the object already has an existing value, providing free food, and the designer is seeking to incorporate AI to further the mission of the fridge in society. Mengying Zhang initially thought that the People's Fridge was a great initiative but observed that people would take more than they needed (2019). She aimed to resolve this issue by adding intelligence to the machine that would extend its role through conversations. Her project involved the development of a script, a series of dialogues resembling the preparation of a movie that would eventually put her own moral bias on stage.

Figure 8.18

A face to face between the user and the moral fridge



Note. [Photograph]. The Moral Fridge (2019). Courtesy of Mengying Zhang.

The project is not yet fully resolved but already offers a compelling vision in terms of process, symmetry, and network. The process of developing intelligent machines

⁴⁴ The People's Fridge is a private project in which a fridge is given to a community so people or organisations can put food in and those who need it can take it out.

resembles an application of virtue ethics, a Western tradition centred on practical wisdom and reflective judgement (Ess, 2023). This approach reveals its limitations, exposing the difficulty of attributing moral development and ethical agency to non-human entities. The first script centred on resolving issues and using the machine to increase control over people. For example, the designer asked the user to provide documentation to prove their need of assistance. She operationalised computer vision and machine learning to infer people's status and make judgements based on superficial categories, such as whether 'they didn't look very poor' (Zhang, 2019). This is a catastrophic approach, which shows that once in power, the mediation of the machine tends to take an easy path. It also disrupts the network surrounding the fridge, as people may stop using it for fear of being judged. However, Zhang revised the scripts by reducing the request for personal information and instead focusing on the fridge's core mission, emphasising the fair sharing of its contents.

In the designer's final version, the fridge prompts the user to clean it or organise its contents by expiry date, contributing to its autonomy and enabling it to better serve those in need. Such requests bring balance to the symmetrical relation with the user, but also restore the network that was initially lost through the designers' early experiment. The fridge, given its role as a public object providing a free service, is in a position to make requests to users, but these requests must operate through exchange rather than through power. This example demonstrates the designer's development, by moving away from the use of technology as control towards establishing a lasting relation between the machine and the user. The ethical process shifted from virtue ethics to relational ethics grounded in the relationship with the object by refocusing on its own network of relation.

Table 8.2

Programming socialness in a moral fridge using process, symmetry and network

Process	Symmetry	Network
Co-individuation between humans through artificial intelligence	The fridge brings symmetry with users by requiring them to do certain tasks.	The user of the fridge becomes part of a network with the fridge.

This example, like the relationship between David and Gigolo Joe, demonstrates that relations with technology are better sustained when they maintain a network through symmetry and a process oriented towards the collective. The cosmos, understood as the way humans perceive and organise the world, is critical here, as it shows how difficult such approaches can be when our default tendency is to take the instrumentalisation of technology for granted. To do so, both the film and the design project share the view that

neither robots nor humans are static constructions, but processes. They both adopt an approach that can be described as co-individuation. Here, transindividuality replaces the binary between individual and society with the concept of metastability (Simondon, 2020). According to Read (2015), metastability describes a state of constant flux and tension that defines the present, where the collective is not a bounded totality that crushes individuals. Instead, each conjuncture is a metastable relation in which gestures, in the case of the fridge, or myths, in the case of the robots, affect others. However, transindividuality is not merely 'concerned with the attempt to construct and maintain authority based on a stable imagination' (p.268). In this case, I suggest that a myth or gesture may provide a better guide, departing from the idea that governance begins with individual capacity and instead grounding it in agreement with others. For this reason, I prefer the term *cosmos*, as it expands the discussion beyond imagination towards the ways we inhabit, organise, and sustain relations. The example demonstrates that the issue with the development of intelligence is one of process more than outcome. Programming a machine to behave as a human beings would in such circumstances is still not achievable. Relatedness through the socialness of machines progressively moves the developer from their position of dominance to a collective understanding of relations.

8.3.2 Discussion: Reframing the Cosmos of Interaction Design through Technological Relatedness

Robots, as one of the most advanced physical forms of intelligent technology, are often framed through their social abilities in relation to humans. However, this understanding of the social is usually limited to the mimicry of human behaviour through trickery. The concept of *cosmos* offers an alternative approach by questioning how we order things and bring them into relation. For Yaneva (2022), 'connecting entities into a liveable assemblage is not enough; [...] they should also be composed in order to design one common world' (p.III). Reflecting on our own *cosmos* is therefore not only a way of unifying people, but also a means of examining how societies have historically produced unity, and whether these approaches remain sufficient in the face of planetary uncertainty.

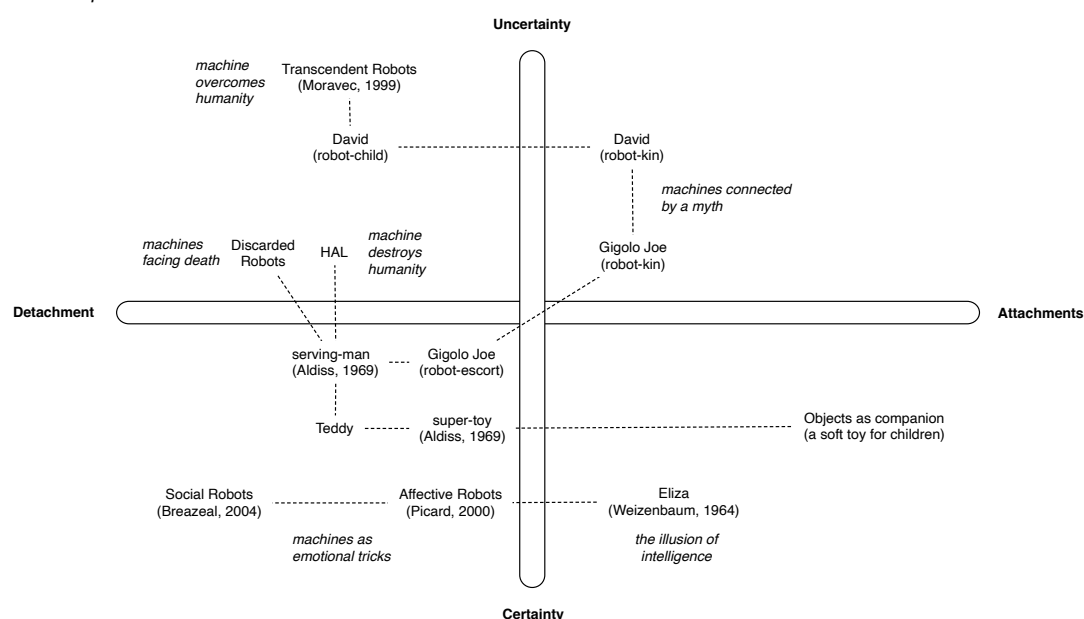
The first way to approach the *cosmos* is one that sees nature as something that is simply there, and, since humans share basic characteristics, our view of the world is, at baseline, the same everywhere. The *cosmos* is not something that is there but something that needs to be composed. The sociologist Ulrich Beck proposes the idea that we all share the place that we live (1999), a perspective known as the *cosmopolitan*. It can be synthesised

by showing that we have different views of the world and once these views can be reconciled, there will be peace. Instead, Latour (2004) suggests that it is not just a human matter, and if the ‘cosmos is to mean anything, it must embrace, literally, everything—including all the vast numbers of nonhuman entities making humans act’ (p.454). This approach to the cosmos is known as the cosmopolitical approach, where the view of the world is one that needs to be negotiated by involving all the entities living in the world. To reflect on this static perspective, I draw on Boullier’s cosmopolitical compass (2015, p.41), which he uses to demonstrate diverse perspectives on nature. I adapt this compass to the context of the relationship with robots through a range of approaches, spanning traditional, modernist, relativist, and cosmopolitical perspectives.

The relationship with the non-human, whether nature or robotics, depends on the worldview we hold. The concept of the cosmopolitical compass enables us to think about the future through plural perspectives, opening space for a relational understanding of technology. According to Boullier (2015), our modern relationship with nature receives little critical challenge because it is assumed to be the only way. However, Latour was pivotal in revealing that our conception of modernity is not modern (Latour, 1991a). Boullier (2015) highlights how we have shifted from a traditional perspective, one that values attachment to nature, to a detached viewpoint that treats nature as something to be exploited. This shift exposes the limitations of the modernist approach, particularly in the context of climate change.

Figure 8.19

A cosmopolitical overview of AI and robots



Note. A Study of Robots using Boullier’s Cosmopolitical Compass Methodology (2015).

Studying the cosmos not only exposes the plurality of relations with nature but also brings to light our entangled and often overlooked relations with technology (Figure 8.19). The challenge begins with finding a relationship with machines that predates the modernist view, one in which attachment with robots is possible. I take the character of Teddy in *A.I.* as an example of a robot, the antecedent of which may just be a soft toy.⁴⁵ The key difference between the soft toy and the robot is that the former is animated while the latter is autonomous. They share the same appearance but compete as companions of the child in different ways. The first is passive but requires the imagination of the child, while the other is active, to the point of bringing normativity to its relationships. The technological progress does not necessarily contribute to the development of the child. Drawing on Buber's terminology (1937/1970), I suggest that we have shifted from an I-THOU relationship of attachment to a I-IT relationship of detachment. The modernist approach manifests through increasing detachment, particularly via techniques where machines use trickery to identify and respond to standardised human emotions, as exemplified in the experiments conducted by Breazeal (Section 8.2.3). Science is here seen as a detachment through the attempt to rationalise emotion using 'emotional tricks' (Sullins, 2012). These tricks are an issue in terms of trust between the user and the machine, according to Sullins (2012), and while they may be necessary for the advancement of technology, they also play a negative role in the making of relationships to support society.⁴⁶

In response to the uncertainty of the world, there is a danger that our worldview is being constructed upon additional layers of trickery, where the fear of extinction drives us towards solutions that are ultimately more and more fictional. According to Latour (1991) and Boullier (2015), modernity in the context of uncertainty risks the resolution of issues through relativism. Faced with the possible extinction of the human race, the tendency is to rely ever more on technology than humanity (Torres, 2023). This is the direction taken in the final part of the film *A.I.*, influenced by Moravec's (2000) notion of the transcendence of machines, which promotes the idea that humanity will ultimately disappear, with

⁴⁵ One might argue that I should begin with an object more directly connected to nature, and that a soft toy already represents a step toward modernism, taming nature rather than accepting it as it is. The soft toy exemplifies a stabilised society, one that has brought nature into the home and seeks to preserve a relationship with it in a domesticated form. I have considered this alternative, but this approach allows me to go further in exploring the relational potential of objects.

⁴⁶ Weizenbaum's ELIZA (1976) is an exception to the modernist approach as the creator is also the one that denounces the trickery of the machine and refuses to let it be used to replace professional psychologists.

machines evolving to replace it entirely. It is a persuasive idea that has influenced other movies such as *Terminator* (Cameron, 1984), which depicts a war won by robots, or *Transcendence* (Pfister, 2014), which portrays an AI capable of saving the Earth by removing humanity altogether. Critically, things remain in relation to one another, but these relations increasingly rely on ever more complex tricks designed to preserve the original artifices of modernity.⁴⁷

The uncertainty of the world can be approached as something to be composed, shaped in ways that help humanity overcome its own limitations. In this process, intelligent technologies such as robots and AI have to assume a stronger social role, not as solutions in themselves, but as ambassadors to nature. Latour (2004) and Yaneva (2015) propose a solution that embraces uncertainty while advocating a re-attachment to the cosmos, a world in which all beings, human and non-human, animate or inanimate, are considered part of a shared, interdependent existence. My proposal emerges from the performative relationship between Gigolo Joe and David through their search of the Blue Fairy (see Section 8.1.3). This is not a definitive solution but a step forward that suggests the myth of the fairy from the novel *Pinocchio* as a possible key.⁴⁸ When David meets its creator, Professor Hobby, he tells it that he is its Blue Fairy (Scene 58) but David refuses to accept this reality. Professor Hobby goes on to say, ‘until you were born, robots didn’t dream, robots didn’t desire’ (Scene 58). This situation is rather ironic, as David chooses not to become modern by refusing to remain a product of humanity, instead opting to live his own experience of the world. However, David’s decision to separate from Gigolo Joe is unfortunate. In doing so, David loses the opportunity to maintain a myth that would unite them in a place to compose their own future collectively. Instead, David waits 2,000 years until it is awakened by robots who have transcended humanity, choosing uncertainty through detachment by going to the third quadrant.

⁴⁷ The notion of a serving-man robot (Aldiss, 1969) is a modernist idea that is ultimately undermined by the AI turning against humans, as exemplified by HAL.

⁴⁸ In a previous treatment by Watson (1991), instead of the Blue Fairy, the scene points to ‘Pinocchio syndrome’ (p.43). Mr Know mentions an experiment in which robots were asked if it was possible for them to become humans. At first the robots question whether they would want to be human, as it is a mortal, messy life. The robots are reminded that, because humans are mortal they can know ‘joy and desire and love, genius, imagination, spirit’ (p.45). In the same treatment, the Blue Fairy is a way for Monica to get rid of David, she says: ‘Find the Blue Fairy and come back as a real child’.

The relatedness through socialness is based on an alternative scripting of the props, drawing from the performative relationship presented between the two robots of *A.I.*. The story should end with David deciding to stay with Gigolo Joe to develop their own myth, inspired by the Blue Fairy. The two robots believing in the myth is the fourth quadrant of the cosmopolitical compass as it creates a society of robots independent of humans. In the film, David leaves Gigolo Joe (Scene 61) and eventually dies with the rest of humanity as other robots transcend. Instead, I use the myth as mediation with the world which requires that the machines find their own cosmos, their own way to believe in the world. In my interpretation, by meeting its creator, David ultimately accepts that it will never be a real child, coming to terms with the fact that the myth it believes is a modernist one. This moment marks a turning point, where the collapse of the myth paves the way for the further emancipation of robots. This is close to Shirley Strum and Latour's performative society of baboons (1987), in which the members strive to define their society by actively negotiating and renegotiating. Only then can they begin to consider other possibilities, moving beyond a singular, rational view of the world towards a more plural and relational understanding. As for the human relationship with machines, it is through their ability to create uncertainty that humanity finds a way to engage and ultimately embrace uncertainty.

The technological relatedness through socialness takes a strategic perspective where the development of intelligent technologies requires rethinking more than our direct relationship with machines to consider the cosmos in which they inscribe themselves. The myth is not only a story but a way to develop robots as 'socially situated individuals' (Adam, 1988, p.136) that go beyond the metal bodies responding to their immediate environment. The beliefs of robots have been explored in science fiction, particularly around themes like climate change and the preservation of humanity. However, the solution is often framed through the third quadrant, the transcendence of machines, where technological evolution surpasses human existence. Instead, the cosmopolitical approach seeks to compose a new way of relating, grounded in our attachment to the world, and mediated through alternative figures, such as Latour's Gaia (2017), the fragile, complex system through which living phenomena modify the Earth. When it is believed by two or more robots, the myth becomes a relay that helps robots achieve more than an emotional or sociable attitude for the benefit of humans but rather the benefit of caring for the world.

8.4 Summary

In this fourth case study, I examine technological relatedness through the lens of socialness in machines, arguing that humanness in intelligent machines should be oriented towards the composition of their own cosmos. Drawing on Suchman's (2007) critique of humanness in machines, I conceive socialness as a way of moving machines beyond human-centred dependency. To develop this argument, I first examine the props in *2001: A Space Odyssey* (1968) and *A.I. Artificial Intelligence* (2001), problematising their humanness through emotion, embodiment, and sociability (Suchman, 2007). HAL represents an early vision of machine humanness, shifting from embodiment towards sociability, while David and Gigolo Joe demonstrate the possibility of machine emancipation through a shared belief.

The performative relationship (RQ1) demonstrates the possibility of sharing a cosmos as robot-kin that goes beyond human-centred programming. In the discussion, the generic performativity shows the large impact of the prop on the research community and the public. The belief in a sentient, conscious version of AI is now persuasive in science and industry, but I argue that they are misled versions of humanness based on Minsky's emotion applied to HAL. Through speculative affiliation (RQ2), I examine how films stage humanness mechanically through voices, suits, and puppetry, revealing relations that oscillate between instrumentalisation and mutual transformation. The examples demonstrate that the relationship with machines involves *performing within the suit*, which can function either as a creative constraint or a novel means of expressing the machine. In the discussion, I identify the gaps between the scientific and humanistic perceptions of humanness in machines, demonstrating that issues such as embodiment, emotion, and sociability require a relational perspective, one that understands our connection with robots as a process of becoming within, where mutual transformation takes precedence.

Finally, I explore how technological relatedness (RQ3) in intelligent systems can be reconfigured through the socialness of machines. This socialness considers robots beyond their human-centred dependency, opening the possibility of relations in which machines contribute to the composition of a shared cosmos. I begin by analysing the Moral Fridge (Zhang, 2019), where the designer examines how artificial intelligence can either reinforce or disrupt existing social relations. This example helps moving away from the use of technology as control towards establishing a lasting relation between the machine and the user. I then reflect further on the possibility of programming socialness into intelligent technologies, where machines are capable of enacting a new cosmos. The robots' belief in

the Blue Fairy suggests that machines can construct collective meaning rather than simply simulate human behaviour. In the final discussion, I move beyond the constraints of modernist thinking. A myth allows robots to situate themselves within a cosmos of their own making, pointing towards a reimagined form of intelligent life embedded in relation with nature and shared world-making.

Chapter Nine

Conclusion and Implications

*Translating Performative Relationships
into Technological Relatedness*

In this final chapter, I recall the main research question raised in the beginning of the thesis: **how might the performative relationship with technological props be translated into technological relatedness?** This is addressed through three secondary questions: **what is the performative relationship and where is it located? (RQ1).** **What key issue does the prop perform in the film, and is issue addressed or resolved by other props? (RQ2).** **What is technological relatedness and how might it be conceived as an innovation in order to move away from the instrumentalisation of technology? (RQ3).** These questions concern the development of intelligent technology using the relationship with technological props in films for their thematic, situated and strategic potential. Methodologically, I address these research questions by identifying technological props on stage and in the films of Stanley Kubrick, show how they come into being, how they perform a specific relationship with the actor or character, how their performance differs from other similar props in cinema, and how they might be reconfigured into technologies of relatedness. I consider the implications of my study of the relationship with technological props within interaction design as *performative artefacts* (Suchman et al., 2002). They are fictional technologies exposed to film as part of their development (Kirby, 2011) but also critical paths for the rethinking of our relationship with intelligent technologies. Accordingly, I draw out key themes that cut across my case studies to demonstrate the potential of human-object relationships as relays that constitute society (Latour, 1994). This, I argue, reframes the question of intelligent technology away from the instrumentalisation of technology into the emergence of a new relationship with technology that I call technological relatedness. In this conclusion, I summarise the findings and the implications of my study in light of the reframing of the relation between people and intelligent technologies, then consider the broader implications for interaction design.

9.1 Key Findings

The development of technological props in films should be understood as a means to aid the reconfiguration of our relationship with technology. The key findings relate to technological props from films and their comparison and reconfiguration into concepts of technological relatedness. In the following paragraphs, I demonstrate the findings applied to five technological props found in the films of Stanley Kubrick, each of which engages with the question of the mechanisation of the human or, conversely, the humanness of

machines. For each phase of the methodology, I outline the research process and present the findings in a table.

The first research question (RQ1) concerns the performative relationship and where it is located. The relationship is one that seeks symmetry between the user and the object, aiming to avoid hierarchical or manipulative power dynamics. Performative relationships emerge from the research in various ways: entirely within the film (Chapter 5), partially within the film (Chapter 8), on stage (Chapter 7), or across both film and stage (Chapter 6). Methodologically, I draw on ANT to examine the formation of the prop, constructing a section narrative that enables an exploration of the object in terms of relational dynamics.

Table 9.1

Performative relationships (RQ1)

Film	Prop	Character	Performative Relationship
<i>Full Metal Jacket</i> (1987)	Rifle	Private Pyle (played by Vincent D'Onofrio)	The Marine Creed is used by the military to create a strong relationship with an object (in the film).
<i>A Clockwork Orange</i> (1971)	Ludovico Treatment	Alex (Malcolm McDowell)	Pain moves through the history, the story, and the stage, and converges to a form of 'pain as a common' (across the film and stage).
<i>Dr. Strangelove</i> (1964)	Glove	Dr Strangelove (Peter Sellers)	The glove is examined as an instauration, which helped the actor transform the object into a mechanical glove (on the stage).
<i>A.I. Artificial Intelligence</i> (2001)	David and Gigolo Joe	David (Haley Joel Osmen) and Gigolo Joe (Jude Law)	A common cosmos for the two robots, which furthers their emancipation through the search for the Blue Fairy (partially in the film).

Across the four case studies, I identify the performativity expressed through the topics of the films and performative relationships between characters and technological props that challenge instrumental understandings of technology. In *Full Metal Jacket* (1987), Pyle represents training as a mediation structured through power and care, while the performative relationship presented by the Marine Creed is used by the military to create a strong relationship with the rifle. In *A Clockwork Orange* (1971), the Ludovico Treatment exposes the tension between free will and behavioural control while the performative relationship is identified as a *pain as a common* as a means to describe how suffering circulates across life, the novel, the film, the actors, and through the technological prop. In

Dr. Strangelove (1964), the glove helped the actor and the director figure out the role through a new reading of the object, but the performative relationship demonstrates a process of instauration in which actor and object mutually shape one another on the stage, producing an agency that appears to exceed the character in the film. Finally, the combined study of *2001: A Space Odyssey* (1968) and *A.I. Artificial Intelligence* (2001) explores the difficult emancipation of intelligent technologies through the study of HAL, David, and Gigolo Joe while the performative relationship reveals the possibility of machines constructing their own cosmos. Together, these cases invite a reconsideration of the mediation of intelligent technologies as co-individuation through training, control, instauration, and socialness.

The second research question (RQ2) examines the key social issue that the props perform in the films, and whether this issue is addressed or resolved by other props in science fiction. The translation of the technological props into an intelligent technology requires further investigation of their social role and whether other props play more favourable roles (Chapters 5 and 8). Methodologically, I employ a speculative affiliation in which a technological prop is extracted from a film and compared with similar enacted technologies, enabling a critical understanding of their performativity.

Table 9.2

Key social issues and their props (RQ2)

Prop	Speculative Affiliation	Social issues
Rifle	'Stun mode' in <i>Star Trek</i> (Roddenberry, 1966-1969), 'selective killing' in <i>Westworld</i> (Joy & Nolan, 2016-2022), 'noble gesture' in <i>Star Wars</i> (Lucas, 1977-1983).	Morality in the Training
Ludovico Treatment	'The neural conditioning device' in <i>Star Trek</i> (Roddenberry, 1969), 'the stack' in <i>Altered Carbon</i> (Kalogridis, 2018-2020), 'cookie' in <i>Black Mirror</i> (Brooker, 2014), 'Z-Eyes' in <i>Black Mirror</i> (Brooker, 2014).	Instrumentalisation of the Social
Glove	'Mechanical glove' in <i>Dr. No</i> (Young, 1962) and Dr Rotwang in <i>Metropolis</i> (Lang, 1927). 'Prosthetic memory' in <i>Total Recall</i> (Verhoeven, 1990) and 'Cyborg memory' in <i>Robocop</i> (Verhoeven, 1987).	Social Cyborg
HAL	Samantha in <i>Her</i> (Jones, 2013), C-3PO in <i>Star Wars</i> (Lucas, 1977-1983), TARS in <i>Interstellar</i> (Nolan, 2014).	Relational Intelligence with Machines
David and Gigolo Joe		

The rifle in *FMJ* exposes the broader systems of training while alternatives such as the Jedi training in *Star Wars* (Lucas, 1977-1983) reframe technological use through discipline and harmony rather than efficiency. Other props, such as those in *Star Trek* (Roddenberry, 1966-1969) and *Westworld* (Joy & Nolan, 2016-2022) are temporary solutions, and not necessarily more desirable, as the focus remains on the materiality of the object. In the discussion, I revisit the morality of the object through the notion of technology as a monster (Latour, 2011), demonstrating that the issue lies with the 'initiators' (Latour, 2011). While I align with this perspective, I extend the argument by attributing responsibility to those who uphold the training system, whether through authority (the Sergeant) or care (Joker) when superficially applied, thus highlighting the broader structures that sustain and perpetuate the system's consequences.

The Ludovico Treatment in *ACO* exposes the limits of techno-solutionism. Enacted technologies underscore the severity of instrumentalisation within the current carceral model by deepening the separation between mind and body, privileging control over rehabilitative approaches. The stack in *Altered Carbon* (Kalogridis, 2018-2020) and the cookie in *Black Mirror* (Brooker, 2014) exemplify the difficulty of creating alternatives. In the discussion, I address the issue of techno-solutionism through the lens of critical criminology, arguing that the goal of building a 'good life and a common good' (Coeckelbergh, 2021) should take precedence over maintaining a good society. In order to achieve this common, some degree of instrumentalisation may be necessary. Drawing on MacIntyre (2007), I argue that intelligent technologies should be configured to adopt a pluralistic approach, one in which instrumentalisation is understood as temporary, creating the conditions for a shift that enables users to develop autonomy.

Dr Strangelove's glove demonstrates how technological objects may participate in individuation through forms of agency, opening questions around prosthetic memory and social hybridity. Enacted technologies underscore the severity of instrumentalisation by augmenting the user's power, as in the character of Dr No (Young, 1962), or by extending the duration of an initial trauma, as demonstrated by the character of Dr Rotwang (Lang, 1927). In the discussion, I identify the notion of 'prosthetic memory' (Landsberg, 1996) in other movies where the prosthesis is an enacted prop that opens to another self. At first, the prosthetic enables the user, as it helps recover what is lost of their body, but the prosthetic can be translated into something more than an instrument for the user. The effect of memory can be reframed as a technological object that defines a new type of

hybrid, a social hybrid which articulates the need to reflect on what constitutes our humanity.

Finally, the relation between David and Gigolo Joe demonstrates the possibility of rethinking the relations between machines. The relation between actors and the robots they enact are generally instrumental, such as HAL in *2001: A Space Odyssey* or C-3PO in *Star Wars* (Lucas, 1977). However, there are exceptions that illustrate a better treatment of the voice actor on the stage, such as Samantha in *Her* (Jones, 2013), the creative use of constraint in the suit, such as the robot in *Robocop* (Verhoeven, 1987), or the association of the voice and movement on the stage to interact with other actors, such as TARS in *Interstellar* (Nolan, 2014). These examples demonstrate that the relationship with machines involves performing *within the suit*, which can function either as a creative constraint or a novel means of expressing the machine. In the discussion, I identify the gaps between the scientific and humanistic perceptions of humanness in machines, demonstrating that issues such as embodiment, emotion, and sociability require a relational perspective, one that understands our connection with robots as a process of becoming within where mutual transformation take precedence.

The third research question (RQ3) resolves the concept of technological relatedness as an alternative to the instrumentalisation of technology. Methodologically, I draw on Latour's concept of composition (2010), which involves assembling a common world from disjointed elements. These elements are provided by the performative relationship, the speculative affiliation, and the discussion in order to compose new relationships with technology. Building on this, I introduce the concept of relatedness as a means of reconfiguring our relationship with technology by problematising technological engagement. I demonstrate that this particular mode of engagement needs to be oriented towards the collective and is grounded in an ongoing process that seeks symmetry with technology across a network of relations. The search for a relation with the collective emerges from theories of mediation, particularly Latour's (1994) work, and is further developed through transindividuality (Simondon, 1958/2017), which I frame as a contribution to mediation that demonstrates the use of technology as part of the process of individuation towards the collective. These modes of relatedness stand in contrast to the behavioural model, focusing on the co-individuation of the user through the activation of intelligent technology in response to collective need rather than conditioning.

Table 9.3*Performative relationship and relatedness with technology (RQ3)*

Prop	Performative Relationship (reframed)	Relatedness with Technology
Rifle	A prayer or ritual (such as the Marine Creed) that connects people and objects.	An intelligent technology that is able to connect users as ‘a relay’ that prioritises the collective ahead of the user.
		Example: a social kettle that understands the limitation of the infrastructure.
Ludovico Treatment	‘Pain as a common’ (such as is the enduring event that crosses between networks).	‘Pain as a common’ is a type of technology that lets nature communicate when it is in trouble.
		Example: a smart textile that connects the body to an aquaponic system.
Glove	An object (such as a glove) that represents the power of the collective.	An intelligent technology that takes existing rules and applies them to objects.
		Example: a motorcycle with social competence.
HAL	An object with the wrong cosmos, such as a machine that has too much emotion.	AI implementations should be written as scripts, where elements of the conversation are analysed to find issues.
		Example: scripting artificial intelligence in the case of a moral fridge.
David and Gigolo Joe	Two machines creating and maintaining their cosmos, such as two robots looking for the Blue Fairy.	Reprogramming robots with sub-goals could allow them to seek their own cosmos: a world that is not separate from humans, but shared with them, whether through nature or through a mythological figure.
		Example: a compass that helps identify tradition, modernity, relativism and cosmopolitics when designing a robot.

In the first case study, I focus on the issue of training where interaction is perceived through its role of mediation. To foster symmetry in the training, I propose embracing friction as a method that modulates the agency of intelligent technologies when they are understood as part of a network of relations, as exemplified by the Creed. The discussion examines the broader implications of technological relatedness in interaction design by reframing sustainability through training. In the second case study, I identify the relationship with technology through the notion of *pain as a common*, where technological relatedness is used to facilitate a deeper connection with nature. This approach proposes an alternative understanding of pain, not as something to be avoided, but as a means of connection. In the example, I discuss a living system that is in danger, such as an aquaponic system that guides people towards a better relationship with nature. It challenges models of individual convenience by incorporating ecological stakes in technological development. Technological relatedness refers to a mode of interaction in which control functions through plurality. The technology may operate persuasively, but only for a limited period of time, as a pathway towards self-mastery.

In the third case study, I identify the relationship with technology through the lens of instauration. Instauration is proposed here as a means of understanding how technological prescription-description emerge relationally, depending on the situation and the user's action or lack thereof. The glove functions as a prosthetic device that both conceals and enables, yet it paradoxically disables Dr Strangelove in moments where the collective is at risk. Technological relatedness refers to a mode of interaction in which technology monitors the user in relation to others and intervenes when the user is judged to pose a risk to others. In the final case study, I examine relationships with robots through the lens of socialness of machines. This concept redefines machine sociability beyond the forms of trickery designed to make machines acceptable to humans through emotion, embodiment, or sociability. To move beyond this limited, instrumentalist view, I propose a model of intelligent machines liberated from the constraints of modernist thinking. The robots' shared belief in a myth serves as a powerful potential where robots are not merely responding to human programming but are, instead, co-constructing a social imaginary, one that enables them to form their own cosmos. A myth allows robots to situate themselves within a cosmos of their own making, toward a reimagined form of intelligent life embedded in relation with nature and shared world-making.

9.2 Original Contribution to Knowledge

The literature review identifies cinema-aided design (Penz, 2018) as a field in which cinema is used to explore design concepts and situations. It shows that props are valuable for the futures they prompt (Dunne & Raby, 2013), the themes they convey (Dourish, 2014), their situated use in film (Penz, 2018), their ambiguity (Raymaker, 2006), and their strategic influence (Kirby, 2011). Early cinema theory and thing theory further reveal the prop's agency, symmetry with actors, and permeability between fiction and reality (Epstein, 1926; Stern, 2004). The review then turns to performance, from Goffman's (1959/1990) theatrical understanding of social life to interaction design approaches such as dramatic performance and personas (Laurel, 1991; Cooper et al., 2014). While these approaches remain largely human-centred, the study of props also shows that they are essential to an actor's performance (Sofer, 2003). Equally, their performativity shapes the way we perceive our relationship with them. For example, props can normalise technological futures (Kirby, 2011), but, as objects, they also problematise their development (Suchman et al., 2002). Building on this, I approach the performativity of the artefact as a relationship, which I translate into technological relatedness as a framework for rethinking engagement with intelligent technologies.

I consider my contribution to be both methodological and conceptual in two key areas of the study of design for interaction: design studies and design exploration. In the first area, design studies, my primary contribution lies in advancing the study of props as a means to study relational dynamics with technology. Rather than evaluating technology solely on the basis of its function or technical capability, I propose an alternative framework that foregrounds the relational potential that fictional technologies carry. The second contribution, also within design studies, involves examining the role of technology through their influence as relay, through which I extend Latour's (1994) theory of mediation by introducing the concept of technological relatedness. I demonstrate that technological relatedness is a mode of engagement with the collective through intelligent technology, grounded in an ongoing process that seeks symmetry with technology across a network of relations. The third contribution is methodological and falls under design exploration, where I propose adapting the concept of translation (Latour, 1994) as an approach to designing technology, using technological props as the basis for inquiry. This speculative and comparative method enables a deeper understanding of how fictional technologies can inform real-world design practices.

The Study of Props as a Means of Exploring Relational Dynamics between Humans and Technology

The concept of performativity is widely used in the fields of science and technology studies (STS) as it shows how language, action, and social behaviour actively bring reality into being. According to Pickering (2016), performativity raises questions about the agency of things, recognising that both human and non-human entities can influence one another. Practically, the performativity of props is addressed through the work of Kirby (2011), who examines how technological props can assist in the introduction of new technologies through films. Kirby (2011) reduces props to the role of prototypes and pays insufficient attention to their impact once they materialise as real technologies, a limitation I seek to address in this research.

As a tool for analysis, performativity problematises existing relationships with technology through film. Considering technology as performative allows for a critique of its dominant instrumental framing. For example, in the formation, the Ludovico Treatment (Chapter 6) exemplifies a technology of control that embodies assumptions of modernity, such as efficiency and hierarchy. Speculative affiliation expands this analysis by comparing the prop with other enacted technologies that address similar relational issues. This leads to new perspectives, such as promoting extended training rather than relying on props that embed technological solutionism, as shown through the comparison between *Star Wars* and *Star Trek* (Chapter 5). It also opens new possibilities, as in Chapter 8, where the relationship between the two robots demonstrates alternative approaches to machine sociability. Performativity therefore reveals both the issues and possibilities of alternative forms of engagement with technology.

The performative study of technology through technological props can be approached at two levels. Firstly, through the paradigm of performative artefacts (Suchman et al., 2002), it emphasises the relational and situated nature of technology. In films, this is done through characterisation (Chapter 5), the consideration of origins (Chapter 6), the practical invention with the actor (Chapter 7), and the emancipation of props (Chapter 8). The use of technological props demonstrates that the making of technology is 'grounded in doing things in a lively material world, growing out of that engagement' (Pickering, 2017). Secondly, the performative study of technology through technological props makes visible the influence of objects beyond the screen. At a discursive level, there is a way to question the use of persuasive technologies as a solution

to social issues (Chapter 6) or the normative influence of fictional technology on real technology (see Chapter 8).

My contribution lies in identifying a specific moment, which I call the performative relationship, in which a technology actively participates in the formation of an actor or a character. Drawing on Bhabha (1994), this type of performativity serves as a means to insinuate, interrogate, and antagonise powerful master discourses. It involves identifying a specific interaction between the character and the technological prop, whether enacted or performed, that demonstrates a use of technology beyond an instrumental perspective. These relationships may be clear in the film, as with the Marine Creed (Chapter 5), but they may also require further research, using durability and boundary analysis to reveal the pain as a common across the film and stage (Chapter 6). They may also require reframing, as in the analysis of the glove operating through instauration, through multiple prescriptions and descriptions that help the actor transform the object into a mechanical glove (Chapter 7). Finally, they may require identifying a narrative moment that reveals the possibility of a common goal between two robots, through their emancipation and search for the Blue Fairy (Chapter 8). These moments may appear in different ways: they may be visible in the film itself (Chapter 5), partially hidden within the production process (Chapter 6), dependent on interpretation (Chapter 7), or made accessible through a slight reframing of the original narrative (Chapter 8).

The performative relationship reveals a transformation in the relation between user and technology, whether this occurs within the film, on stage, or across both. Drawing on the notion of the performative artefact (Suchman et al., 2002), I understand the prop as situated and relational, while also arguing that the process through which this relation is transformed is equally important. The Creed (Chapter 5) triggers a change in the user that reveals his attachment to the rifle. The Ludovico Treatment (Chapter 6) facilitates the transfer of violence from fiction to the stage. The glove, understood as an instauration, demonstrates other possibilities for agency with an object (Chapter 7). Finally, the relation between David and Gigolo Joe shows the possibility of forming associations between machines (Chapter 8). These transformations may originate from historical situations, such as the Creed in Chapter 5, but they more often emerge through a process of co-production between authors, actors, props, and the wider production context.

The Influence of Technology as a Relay: Technological Relatedness

The second contribution is conceptual and extends mediation theory. Building on Verbeek (2019), who understands interaction design as a relational process in which humans and technologies co-constitute one another, I shift the focus from immediate human–technology interaction to the broader social effects of mediation. I therefore examine the interaction with technology as a relay within society, capable of shaping relations beyond the individual user and the object (Callon, 1984; Latour 1992). To develop this perspective, I introduce my own concept; technological relatedness. Derived from the anthropological notion of relatedness (Carsten, 2000; Bird-David, 2016), I propose technological relatedness as a mode of engagement with the collective through intelligent technology, grounded in an ongoing process that seeks symmetry with technology across a network of relations. By process, I understand the technological relationship as something continually ongoing rather than fixed. Drawing on Simondon’s theory of transindividuality (Simondon, 1958/2017), it is oriented towards a co-individuation between humans and technology that supports the collective.

The key element presented in this research is the use of interaction design as a mode of engagement with the collective, which I refer to as technological relatedness. The term engagement in design can refer either to public engagement through speculative props to provoke discussion about the future (Dunne & Raby, 2013), or approaches in which smart technologies frame convenience as a benefit while supporting forms of monetisation. My perspective is that engagement should prioritise consequences over immediacy. Technological relatedness is therefore neither simply an interface nor an experience, but a way of rethinking technology through its capacity to make people think and act in relation to the collective. Engagement is not merely the use of technology; it refers to the ways relations are established, maintained, and transformed.

The theory of transindividuality bridges the gap between Verbeek and Latour’s perspectives on mediation by providing the conceptual tools to understand the individual as a process of change and in relation to the collective. Transindividuality is an acknowledgement of political relations as mutually constitutive processes by challenging the traditional binary between individual and society by showing that the ‘I’ and the ‘we’ are produced through the same movement. While mediation focuses on the interaction with the object (Verbeek, 2014) and the consequences that emerge from it (Latour, 1992),

the collective individuation addresses how technology modulates the individual towards the collective.

Table 9.4

Transindividuality through mediation

Smart technology	Transindividuality	Operator	Mediation
A Smart Kettle	Co-individuation between individuals and their neighbourhood	Allagmatic (convertibility of operation into structure)	Training through friction
A Smart Textile	Co-individuation between individuals and non-human entities	Modulation (force is variable)	Control through plurality
A Motorcycle with Social Competence	Co-individuation between individuals as a lateral process.	Instauration	Symmetry through instauration
Robots with Socialness	Co-individuation between machines and other machines	Socialness	A common cosmos

As a first example, I present a smart kettle (Smidt, 2016) that converts the capacity of the electrical infrastructure into an operation. This approach, understood as an allagmatic operation, draws directly on Simondon (2020). It is presented as a means of maintaining a relationship with infrastructure while also enabling communication between people in their neighbourhood through their kettles. In practice, the proposal is to deliver electricity sequentially rather than concurrently which creates a mediation through friction, transforming the kettle from an object of convenience into one that trains the user to engage with the limits of infrastructural capacity. This approach contributes to sustainable design by shifting the focus from individual behaviour towards collective engagement.

The second example is a smart textile (Lyu, 2018) that allows the wearer to perceive the activities and issues of an aquaponic system through a range of vibrating signals. It reframes pain as a process of modulation, transforming an immediate relation with the system into a common with nature. The aim of the project is not to transfer pain as such, but to make the functioning of a symbiotic system between fish and plants perceptible. It may include uncomfortable vibrations when the system is not working properly, enabling

the user to participate in and form a common with non-human entities. This approach contributes to more-than-human design by allowing the symbiotic system to exercise agency. Control is therefore not perceived as continuous, but as something that intervenes at specific moments.

The third example is a speculative technology that disables a motorcycle in specific situations, such as when it mounts the pavement. It remains inactive most of the time but becomes active in moments when the rider fails to exercise their social competence. The transindividual operation manifests laterally rather than hierarchically as the motorcycle is not stopped by an external authority, but by the presence of someone who feels at risk. This approach contributes to interaction design by reducing human agency through the motorcycle.

The fourth example is not a technology as such, but a speculative approach to robotics that problematises sociability, which often relies on various forms of trickery to make robots more acceptable to humans. Instead, I approach robotics through the concept of socialness, understood as a way of engaging in the composition of a shared cosmos with machines. In this context, relatedness becomes a strategic engagement with the influence of machines, bringing them into a relational space where they may act in the interest of humanity.

Design as Translation

The third contribution is methodological and lies in the area of design exploration, where translation is used to investigate and reconfigure relationships with technology. It stems from the development of a new methodology grounded in the concept of translation (Latour, 1992). Here, it has been adapted to contribute to the making of new intelligent technologies through the study of technological props. Latour's concept of translation differs from that of designers (see Hornbuckle & Page, 2024, for example). Designers often ignore or underestimate the role of instrumentalisation in technology, approaching society and the environment through limited concepts that reduce them to contexts or problems to be managed. For example, the film *A Clockwork Orange* examines a technology, the Ludovico Treatment, as a system of control that removes human agency to protect society. The film exposes an application of technology whose translation remains incomplete or inadequate. This is what Latour (2005b) calls a *double-click*, the false pretence of scientific

research that demonstrates a simplified relationship with technology. Here, I consider the translation of the object to be a slow transformation of technology.

Translation is demonstrated as a methodology throughout the thesis. It begins by identifying the black box (1), the moment when a technological prop causes an issue in the film, such as the suicide of Pyle with the M-14 rifle (Chapter 5). The first stage concerns the formation (2) of the prop and the character by problematising their performativity through the scripting (Akrich, 1992) of the objects and the characters. I take the perspective that these objects may be defined by their authors (Chapter 5), but also emerge through co-production with actors (Chapters 6 and 7) and external influences (Chapter 8) which introduce a variety of degrees of performativity. Such relations may be rooted in structures of power and care (Chapter 5), revealed through the durability and boundary effects of objects (Chapter 6), emerge through the co-individuation of a character and a prop (Chapter 7), or be explored through the humanness of machines (Chapter 8). Performativity therefore acts as a mode of discovery, revealing relations that are reproduced through institutions, shaped during production, or tested through encounters with intelligent technologies.

In order to reflect on these influences, I construct a section narrative, a parallel story that focuses on the development of the objects. The aim of the formation stage is to reveal a social narrative that differs from the film's plot, enabling the identification of a performative relationship (3). This refers to a particular relationship with technology that moves beyond its instrumentalisation, as illustrated by the notion of pain in common (Chapter 6). The second stage concerns speculative affiliation (4). In this stage, the technological prop is compared to other similar props to demonstrate its alignment with, or divergence from, the dominant paradigm of technological instrumentalisation. For example, other prosthetic gloves in cinema augment the power of the user, whereas Dr Strangelove's glove removes influence from the user (Chapter 7).

The final stage of the methodology concerns the composition (5). Drawing on Latour (2010), design can be understood as a process of de-composition and re-composition, through which the assumptions of modernism are carefully dismantled. This opens the possibility of embracing a vision of the social that takes nature as the main concern rather than a mere background (Latour, 2005a), where care for humanity exceeds the mere aggregation of isolated individuals. The composition into technological relatedness is addressed in the previous section, particularly through the elements that

constitute relatedness: process, symmetry, and network. The process of re-composition therefore seeks to reconnect individuals with the collective, materialised into a network through technological relatedness. Thus, the props are recomposed towards the co-individualisation of people in a neighbourhood (Chapter 5), between human and non-human entities (Chapter 6), with other people when technology disrupts the relation (Chapter 7), with artificial intelligence (Chapter 8), or between robots (Chapter 8).

Table 9.5

The translation from prop to intelligent technology through process, symmetry and network

	Process	Symmetry	Network
1. Private Pyle's Rifle	Performativity through power and care	The Marine Creed	A third force that compels the trainees
A Smart Kettle	Co-individuation between people in the neighbourhood	The kettle gives agency to the infrastructure	The kettle acts as third force in the neighbourhood
2. The Ludovico Treatment	Performativity through the durability and the permeable boundary of the Ludovico Treatment	Pain as a common (it circulates)	Pain as a common (maintains the network)
A Smart Textile	Co-individuation between human and non-human entities	The bracelet enables communication with nature when it is in difficulty (a plural force)	The bracelet maintains the common through a network between human and non-human entity
3. Dr Strangelove's Glove	Performativity through the improvisation of the actor	(stage) Instauration between the prop and the actor	Social actors in the room
	Performativity through the action of Dr Strangelove	(film) Instauration: the glove learns from Dr Strangelove's memory and his environment	The memories of Dr Strangelove in relation to the characters in the room
A Smart Motorcycle with Social Competence	Co-individuation between human and other humans	The motorcycle is able to stop the user in certain situations	Acting on the infraction is only activated by people on location
4. HAL, David and Gigolo Joe	Performativity through emotion, embodiment, and sociability	Machines can be understood as capable of emancipation	Gigolo Joe joins David in searching for the Blue Fairy (as a myth)
Socialness in Artificial Intelligence	Co-individuation between humans through artificial intelligence	The fridge brings symmetry with users by requiring them to do certain tasks	The user of the fridge becomes part of a network with the fridge
Socialness in Robotics	Co-individuation between machines	The emancipation of machine happens through a common goal	The emancipation happens in a selected network

Translation builds on the discoveries made through the research, such as the symmetry between people and objects. Symmetry and network are central to the work of Latour and ANT methodology in particular, as it considers the agency of both humans and non-humans. However, a key contribution is to examine these symmetries further through their duration, strength, and reliance on existing networks. The Creed (Chapter 5) shows that it is temporary while the pain as a common show it can be sustained over a longer duration (Chapter 6). Symmetry may appear in moments of necessity, particularly in response to a crisis (Chapter 7). The emancipation of robots might be a unique case of definitive symmetry with humans (Chapter 8). These findings are applied to technologies when the duration needs to be longer to have an effect (Chapters 6 and 8), or applied to one appliance rather than all (Chapter 5). Specifically, rare and strong interventions (Chapter 7) are key to making an impact. In terms of strength, the importance of the kettle is to act as a third force that slowly changes the perception of infrastructure (Chapter 5) and social robotics (Chapter 8), or a plural force that alternates between strength and softness (Chapters 6 and 7). However, granting greater agency to technology is delicate. For this reason, I suggest that such agency must emerge from an existing network of lateral relations and be grounded in specific contexts, such as a neighbourhood (Chapter 5), a natural system (Chapter 6), people nearby (Chapter 7), or robots having their own cosmos (Chapter 8). This differs from the morality of objects (Tromp et al., 2011), where force is often the primary element considered (see Chapter 7). Here, agency depends on a conjunction of elements: duration, strength, and network, where the strength may emerge from symmetry, but also from the network.

9.3 Limitations of the Research

This study demonstrates a method in which a film prop is considered in terms of relationship, in order to reconfigure our relationship with technology. Two key limitations can be identified. The first concerns the examples I propose, which are primarily evocative and situated within a design framework, rather than realised as fully implemented interventions. While they serve to open critical reflection and speculative possibilities, their practical application remains limited. For instance, the issue of speaking for nature and the democratic representation of non-humans, raised by Brown (2018), remains largely unresolved and calls for further empirical and political reflection. In Chapter 6, for example, I advocate the use of pain as a common in our relationship with intelligent technologies, but little is said about how this paradigm should be implemented in detail.

The second limitation concerns the broader requirement for a paradigm shift, one in which technology is understood not merely as a tool for instrumental use, but as a form of mediation between society and nature. This reorientation remains challenging, as it requires reconfiguring deeply embedded assumptions about technological progress and who is in charge of it. Unfortunately, the role of technology remains largely shaped by industrial interests and driven by the need for efficiency and user addiction. As long as governments fail to take the societal relationship with intelligent technologies seriously, the broader impact of this research will remain limited.

9.4 Recommendations

The recommendations are diverse, encompassing topical concerns, methodological approaches, and the broader outcomes of the research, while also proposing potential solutions to the limitations. Technological props represent a distinct category of object, due to their capacity to be examined both as situated and thematic objects, at once material and fictional, through which relationships, influences and consequences can be critically explored.

The topics explored in this thesis are examined for their potential to open up new avenues of research into intelligent technologies. The coherence of this thesis relies heavily on the films of Kubrick and the thematic choices made, such as the mechanisation of the human, as identified by Seesslen & Jung (1999) and the humanness of technology. The topics have a parallel in contemporary research, such as the re-engineering of the human (Frischmann & Selinger, 2019; Zuboff, 2020; Orłowski, 2020) and the embodiment, emotion, and sociability of machines (Suchman, 2007). Future investigations could build on this work by engaging more deeply with its core themes, as well as the specific topics addressed throughout. These include the use of technology in training (Chapter 5), the application of control as plurality (Chapter 6), the role of instauration (Chapter 7), and socialness of robotics (Chapter 8). In particular, I believe that the mediation of intelligent technology through co-individuation holds significant potential, especially considering the importance of the relationship between the individual and the collective and how technology might be able to mediate that relationship.

My first recommendation relating to the methodology is using films in a combined approach using thematic and situated analysis, as in this study. Futuristic objects, as seen in the many examples of affiliation, do not necessarily change the current relation we have

with technology. They may seem to improve a situation temporarily, but further analysis shows that the improvement is minimal. The stun gun in *Star Trek* serves as a compelling example. While the technology appears intriguing in the fictional context, its translation into a real-world device, such as a taser, reveals a set of ethical and practical issues not addressed in the television series. The objects are chosen following a certain theme, mechanisation, which can be read in two ways, becoming more mechanical (as in re-engineering humanity) or as in robotics where the machine is a balance between mechanisation and humanness. The mechanisation is present in the influence of the instruments we make, but which do not necessarily need to be futuristic or dystopic to be true. The archival research could eventually be replaced by research on location as demonstrated by Steve Woolgar and Latour (1979) who study life in a laboratory. Such an approach might be interesting, as an embedded design researcher could analyse the decision-making process regarding props with precision.

Finally, in addressing the limitations of this research, I suggest that further practical investigation is needed into the democratic representation of non-humans, as highlighted by Mark B. Brown (2018). This includes exploring the relationships between humans and non-humans, particularly through the inclusion of intelligent technologies. Additionally, the instrumentalisation of technologies suggest examining the weaknesses of democratic institutions, particularly their limited capacity to implement significant societal change, as highlighted by H  l  ne Landemore (2020). While Landemore underscores the need to establish citizen assemblies empowered to propose alternative solutions, I suggest that relatedness with intelligent technologies could play a key role in supporting this process by helping to maintain relations with both the environment and the social over time.

Appendix A

Production Letters of *A Clockwork Orange*

cc: SK
LB
JB
file (2) - BW
prod

SC 113/2/1/19

SK-12-8-5

PLEASE REPLY TO:
PO Box 123
Borehamwood
Hertfordshire
Tel: 01-953 8827

PRIVATE & CONFIDENTIAL

Dr H. F. Gundry F.R.C.S.
Moorfields Eye Hospital
City Road
London E.C.1

Wednesday 12 August 1970

Dear Doctor Gundry

"A CLOCKWORK ORANGE"

I am most grateful to you for sparing your valuable time to come and see Stanley Kubrick at Elstree and discuss our requirements for filming the sequence involving the insertion of lid clamps to Malcolm McDowell, our leading actor in this production.

As I explained to you yesterday, after my visit to Brunel University, it was impossible for us to plan filming there the first week of September; we have therefore re-scheduled this sequence to commence Tuesday 15 September. It is possible that this could fall back a day or two but I would like you to be prepared to join us for filming on the 15th.

For the days filming I would like to confirm that we have agreed that you could obtain or supply five sets of identical lid clamps, the cornea lubricating drops and the local anaesthetic for inserting the lid clamps. As you have mentioned we shall obtain a three-minute sterile unit and have the room cleaned for the day we film there. We would also need the assistance of your Theatre Sister for the day. As you further mentioned, I will advise Malcolm McDowell to obtain a pair of sunglasses for him to wear after this sequence has been completed.

We shall clear with the appropriate unions for you and the Sister to appear in the scene as actor and actress.

It is further agreed that we shall pay you the sum of 50 guineas to cover your assistance and professional advice. I would be grateful if you could advise me as to what you feel we should pay the Theatre Sister for her services.

Perhaps you would be kind enough to confirm to me in writing, at your earliest possible convenience, your agreement to this letter. I'd be grateful to have your home telephone number in case of any emergency during this production.

Yours sincerely
for and on behalf of
HAWK FILMS LIMITED

BERNARD WILLIAMS
Production Manager

8K / 13 / 2 / 15

FROM: BERNARD WILLIAMS

Tuesday 7 July 1970

TO: STANLEY KUBRICK

Re: Lid Locks

I have talked to the British Medical Association this morning at 387-4499 who advised that I should talk to Dr Pedlar's office at the Institute of Ophthalmology, 387-9621. Dr Pedlar's home address and number is:-

119 Park Hill
London S W 4
622-6713

Unfortunately Dr Pedlar has had a car accident and I spoke to an assistant of his, Dr Lockett and explained our requirements regarding lid locks.

He advised that the operations are normally carried out in two ways - with a speculum which is a safety-pin process of two spring loaded arms with hooks which fit under the eyelids; or they stitch into the eyelid.

He advised that we should contact C. W. Dixeys of 19 Wigmore Street, W.1
Tel: 580-1713, and John Weiss and Son Ltd. of 17 Wigmore Street, W.1
Tel: 636-5893 who are surgical instrument makers and suppliers, for up to date reference and literature regarding lid locks. Also to contact the Theatre Superintendent of the Moorfield Eye Hospital, City Road, London E.C.1
Tel: 253-3411 who would give us information and possibly be able to show us a film of an eye operation, but he didn't expect that we would get permission to go into an actual operating theatre because of the protection of patients' rights.

Report from C. W. Dixeys

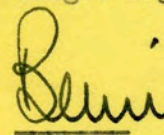
I talked with Mr Humphries there who is most helpful. He is going to send us information regarding the Barraquers wire lid speculum which is made of thin polished stainless steel wire, and the latest retractor-type which is being manufactured in Holland, and which is principally a system of pulling up or down the eyelids and fixing with self adhesive. He pointed out that obviously with eye operations the patient is unconscious and that to fix the lid lock to a conscious person might be uncomfortable as the person cannot blink.

Report from John Weiss

They will forward us data on manufactured items.

Report from Theatre Superintendent, Moorfields - Sister Watkins

Sister Watkins was most helpful. She will explain our requirement to the Senior Resident Officer who is the top man there who will telephone me this afternoon. His name is Mr Gundry. Sister Watkins reminded us that for filming purposes there is a danger of eye infection under bright lights unless the cornea is kept moist in a dry atmosphere.


B.W.

Appendix B

Comparing the Scripts of *Dr. Strangelove*

pre-shooting script (SK11/1/23)

1 DR. STRANGELOVE
(German precision)
Mister President, under the authority granted me as Director of Weapons Research and Development, I commissioned a study last year of this project by the Bland Corporation. Based on the findings of the report, my conclusion was that this idea was not a practical deterrent for reasons which at this moment must be all too obvious.

2 AMBASSADOR DE SADE
Mister President, the technology required is easily within the means of even the smallest nuclear power. It requires only the will to do so.

3 DR. STRANGELOVE
Mister President, it is not only possible, it is essential. That is the whole idea of this machine. Deterrence is the art of producing in the mind of the enemy the fear to attack. And so because of the automated and irrevocable decision making process which rules out human meddling, The Domsday Machine is terrifying, simple to understand and completely credible and convincing.

4 DR. STRANGELOVE
It is remarkably simple to do that. When you merely wish to bury bombs there is no limit to the size. After that they are connected to a gigantic complex of computers. A specific and clearly defined set of circumstances under which the bombs are to be exploded is programmed into the tape memory banks. A single roll of tape can store all the information, say, in a twenty-five volume encyclopaedia, and analyse it in fifteen seconds. In order for the memory banks to decide when such a triggering circumstance has occurred, they are linked to a vast interlocking network of data input sensors which are stationed throughout our country and orbited in satellites. These sensors monitor heat, ground shock, sound, atmospheric pressure and radio-activity. Other more sophisticated devices could even monitor world radio broadcasts.

combined script

DR. STRANGELOVE
(German precision)
[redacted] under the authority granted me as Director of Weapons Research and Development, I commissioned last year a study of this project by the Bland Corporation. Based on the findings of the report, my conclusion was that this idea was not a practical deterrent for reasons which at this moment must be all too obvious.

[redacted]
Mister President, the technology required is easily within the means of even the smallest nuclear power. It requires only the will to do so.

DR. STRANGELOVE
Mister President, it is not only possible, it is essential. That is the whole idea of this machine. Deterrence is the art of producing in the mind of the enemy the fear to attack. And so because of the automated and irrevocable decision making process which rules out human meddling, The Domsday Machine is terrifying, simple to understand and completely credible and convincing.

DR. STRANGELOVE
It is remarkably simple to do that. When you merely wish to bury bombs there is no limit to the size. After that they are connected to a gigantic complex of computers. A specific and clearly defined set of circumstances under which the bombs are to be exploded is programmed into the tape memory banks.

post-shooting script (SK11/1/27)

STRANGELOVE
(in wheelchair)
A moment please, Mr. President.

Stomps one foot on the tile floor, pushes back from the table and begins wheeling towards the discussion between Muffley and DeSadeski.

STRANGELOVE
Under the authority granted me as director of weapons research and development, I commissioned last year a study of this project by the Bland corporation. Based on the findings of the report, my conclusion was that this idea was not a practical deterrent, for reasons which, at this moment, must be all too obvious.

STRANGELOVE
Mr. President, the technology required is easily within the means of even the smallest nuclear power. It requires only the will to do so.

STRANGELOVE
Mr. President, it is not only possible, it is essential. That is the whole idea of this machine, you know. Deterrence is the art of producing in the mind of the enemy... the fear to attack. And so, because of the automated and irrevocable decision making process which rules out human meddling, the doomsday machine is terrifying. It's simple to understand. And completely credible, and convincing.

STRANGELOVE
Well, it's remarkably simple to do that. When you merely wish to bury bombs, there is no limit to the size. After that they are connected to a gigantic complex of computers. Now then, a specific and clearly defined set of circumstances, under which the bombs are to be exploded, is programmed into a tape memory bank.

pre-shooting script

combined script

post-shooting script

DR. STRANGELOVE

The only thing I don't understand, Mister Ambassador, is the whole point of the Doomsday Machine is lost if you keep it a secret. Why didn't you tell the World?

DR. STRANGELOVE

the whole point of the Doomsday Machine is lost if you keep it a secret. Why didn't you tell the World?

STRANGELOVE

Yes, but the... whole point of the doomsday machine... is lost... if you keep it a secret! Why didn't you tell the world, eh?

INT. WAR ROOM

Strangelove executes an about face from the big board to face the camera.

VON KLUTZ

Mister President, I would not rule out the chance to preserve a nucleus of human specimens.

STRANGELOVE

specimens. It would be quite easy... heh heh...

It would be quite easy... heh heh...

VON KLUTZ

At the bottom of some of our deeper mine shafts.

VON KLUTZ

Of course! The radioactivity would not penetrate a mine some thousands of feet deep.

VON KLUTZ

In a matter of weeks, sufficient improvements for dwelling space could be provided.

VON KLUTZ

(smiling wisely)

Mister President, man is an amazingly adaptable creature. After all, the conditions would be far superior to those, say, of the so-called Nazi concentration camps, where there is ample evidence most of the wretched creatures clung desperately to life.

In a matter of weeks, sufficient improvements for dwelling space could be provided.

(rolls forward into the light)

At the bottom of ah... some of our deeper mineshafts. The radioactivity would never penetrate a mine some thousands of feet deep. And in a matter of weeks, sufficient improvements in dwelling space could easily be provided.

pre-shooting script

combined script

post-shooting script

STRANGELOVE

Well let's see now ah...
(searches within his
lapel)

... cobalt thorium G...
(notices circular slide
rule in his gloved hand)

... aa... mn... Radioactive half-life of
uh, ... hmm... I would think that uh...
possibly uh... one hundred years.

STRANGELOVE

Well let's see now ah...
(searches within his
lapel)

... cobalt thorium G...
(notices circular slide
rule in his gloved hand)

... aa... mn... Radioactive half-life of
uh, ... hmm... I would think that uh...
possibly uh... one hundred years.

On finishing his calculations, he pulls the slide rule roughly from his gloved hand, and returns it to within his jacket.

VON KLUTZ

(smiling modestly)

It would not be difficult. Nuclear reactors could provide power almost indefinitely. Greenhouses could maintain plant life. Animals could be bred and slaughtered. A quick survey would have to be made of all the suitable minesites in the country, but I shouldn't be surprised if space for several hundred thousand of our people could be prepared.

VON KLUTZ

(smiling modestly)

It would not be difficult. Nuclear reactors could provide power almost indefinitely. Greenhouses could maintain plant life. Animals could be bred and slaughtered. A quick survey would have to be made of all the suitable minesites in the country,

But I would guess... that ah, dwelling space for several hundred thousands of our people could easily be provided.

VON KLUTZ

I am sure the Armed Forces could deal with any disobedience.

VON KLUTZ

A special committee would have to be appointed to study and recommend the method and criteria of choice.

STRANGELOVE

Well, that would not be necessary Mr. President. It could easily be accomplished with a computer. And a computer could be set and programmed to accept factors from youth, health, sexual fertility, intelligence, and a cross section of necessary skills. Of course it would be

VON KLUTZ

Off-land, I should say that in addition to the factors of youth, health, sexual fertility, intelligence, and a cross-section of necessary skills, it would be absolutely vital that our top government and military men be included, to foster and impart the required principles of leadership and tradition.

STRANGELOVE

Well, that would not be necessary Mr. President. It could easily be accomplished with a computer. And a computer could be set and programmed to accept factors from youth, health, sexual fertility, intelligence, and a cross section of necessary skills. Of course it would be absolutely vital that our top government and military men be included to foster and impart the required principles of leadership and tradition.

slams down left fist. Right arm rises in stiff Nazi salute.

pre-shooting script

17 VOM LUTZ
(laughs, distastefully)
Naturally, they would breed prodigiously, eh? There would be much time and little to do? With the proper breeding techniques, and starting with a ratio of, say, ten women to each man, I should estimate the progeny of the original group of 200,000 would emerge a hundred years later as well over a hundred million. Naturally the group would have to continually engage in enlarging the original living space.

combined script

(laughs, distastefully)
Naturally, they would breed prodigiously, eh? There would be much time and little to do? With the proper breeding techniques, and starting with a ratio of, say, ten women to each man,
I would guess that they could then work their way back to the present gross national product within say, twenty years.

post-shooting script

STRANGELOVE
Arrrrr!
(restrains right arm with left)
Naturally, they would breed prodigiously, eh? There would be much time, and little to do. But ah with the proper breeding techniques and a ratio of say, ten females to each male, I would guess that they could then work their way back to the present gross national product within say, twenty years.

20 VOM LUTZ
When they emerge, a good deal of present real estate and machine tools will still be recoverable, if they are moth-balled in advance. I would guess they could then work their way back to our present gross national product within twenty years.

21 VOM LUTZ
Certainly not, sir. When they go down into the mine, everyone else will still be alive. They will have no shocking memories, and the prevailing emotion should be one of a nostalgia for those left behind, combined with a spirit of bold curiosity for the adventure ahead.

22 VOM LUTZ
Regrettably, yes. But it is a sacrifice required for the future of the human race. I hasten to add that since each man will be required to perform prodigious service along those lines, the women will have to be selected for their sexual characteristics, which will have to be of a highly stimulating order.

STRANGELOVE
No sir...
His right arm rolls his wheelchair backwards
Excuse me.

STRANGELOVE
No sir...
His right arm rolls his wheelchair backwards
Excuse me.

When they go down into the mine, everyone else will still be alive. They will have no shocking memories, and the prevailing emotion should be one of a nostalgia for those left behind, combined with a spirit of bold curiosity for the adventure ahead.

VOM LUTZ
Regrettably, yes. But it is a sacrifice required for the future of the human race. I hasten to add that since each man will be required to perform prodigious service along those lines, the women will have to be selected for their sexual characteristics, which will have to be of a highly stimulating

STRANGELOVE
Also when... when they go down into the mine everyone would still be alive. There would be no shocking memories, and the prevailing emotion will be one of nostalgia for those left behind, combined with a spirit of bold curiosity for the adventure ahead! Ahhhh!

Right arm reflexes into Nazi salute. He pulls it back into his lap and beats it again. Gloved hand attempts to strangle him.

STRANGELOVE
Regrettably, yes. But it is, you know, a sacrifice required for the future of the human race. I hasten to add that since each man will be required to do prodigious... service along these lines, the women will have to be selected for their sexual characteristics which will have to be of a highly stimulating nature.

pre-shooting script

23
YOU ENTER
(correctly)
Thank you, sir.

combined script

>
[REDACTED]
(correctly)
Thank you, sir.

post-shooting script

STRANGELOVE
Thank you, sir.

24

STRANGELOVE
... Sir!
(stands up out of his
wheelchair)
I have a plan. Heh.
(pauses, realizing that he
is standing)
Mein Fuhrer, I can walk!

STRANGELOVE
... Sir!
(stands up out of his
wheelchair)
I have a plan. Heh.
(pauses, realizing that he
is standing)
Mein Fuhrer, I can walk!



Appendix C

Production Letters of *2001: A Space Odyssey*

Minsky computer notes
computer is never turned off
computer feels as if it has been on every space mission ever done

" Because I have so much more information than you have. "
" and abilities"

computer is always cross talking cross talking with other
computers around the world -- you never know and it is not
worth the bother of knowing - usually.

assume anything you want for an intelligent person, including pseudo
emotions

COPY - Roger Caras.

Mr. Eugene R. Riordan.
International Business Machines Corporation.
Armonk,
New York,
U.S.A.

24th August 1965.

Dear Gene,

As the screen play of the film "2001 - A Space Odessey" continued to develop the role of the computer is expanding. In line with this expansion, I have a number of questions that I would like to pose to your specialists, most of them having to do with the quasi-independent action that conceivably could be taken by Athena.

Let us look down the road to the yeay 2001 A.D. Do you think that by that time computers will be able to think, so to speak, somewhat to themselves and to initiate any actions that are not strictly according to the programming? Could Athena, for example, independently decide to awaken an astronaut in hibernation based on incomplete information available to her? What we are after are "grace notes" - things that are plausible but do not stray far from the probable.

Suppose in the interest of secrecy, that some important mission information were made known only to the vehicle commander and not to the rest of the crew. Because the crew had access to Athena, this information could not be stored in her. Yet she will be aware that certain flight procedures were being taken in a manner inconsistent with information available to her. Take another possibility that occurred to us. Could Athena become slightly hypochondriacal, reporting rather more than necessary - not to be overdone - that this or that circuit or device should be checked for malfunction or impending malfunction? It would have to be very cautiously presented at a threshold that would barely raise the suspicions of the mathematicians and computer specialist aboard. Athena might also exhibit agressions, of a mild type, that would somehow be manifested.

I hope that our line of thinking is coming through from above. We want to play this very subtly and certainly not overdo it, and thus wantas many inputs and as much advice from you as you can supply on future computer "temperaments" and personality.

Taking advantage of this letter I would like to be brought up to date on the status of the activities of Eliot Noyes and your people regarding Athena design and the availability of hardware. The preliminary design prepared by Eliot and his staff was most interesting but it seems, from the set design point of view, that it will be most difficult to handle. I recommend that the design, including action

continued:

instrumentation and input and output devices, be made to fit two wall areas each 6' high and $11\frac{1}{2}$ ' long. Many of the same features of the current design could be accommodated by the flat arrangement. Unfortunately, we must abandon the arm lift system due to technical difficulties.

I know you are maintaining close coordination between Eliot and Roger Caras, so I'll send along copies of this letter to each to ascertain they are kept fully informed.

With best personal regards,

Sincerely yours,

Frederick Ordway III.

RAC/EES

16th February, 1966.

Mr. Eugene R. Riordan,
I.B.M.,
Old Orchard Road,
Armonk, N.Y.10504,
U.S.A.

Dear Gene,

Pursuant to our phone conversation yesterday I would like to fill you in once more on the matter of the equipment failure in Stanley Kubrick and Arthur C. Clarke's "2001: A SPACE ODYSSEY".

Last year, before I left the United States, Fred Ordway wrote to you and told you that the script had evolved so that there was failure of equipment aboard one of the space craft and that the equipment involved was a computer. After I came over to England last November I wrote to you again and reiterated this fact. This fact was also presented to Ernest Bevilacqua and to Eliot Noyes. All of this by making it clear that at no time has any member of this Organisation attempted to cover this fact up. We are obviously concerned that you people are concerned at this late date since we are very much into the film and any possible change is unthinkable. I don't suggest that you asked that we make a change in the script, but I did want to make it very clear that there is nothing that can be done that has not already been done.

What we have done is the following:

- (a) The equipment that fails is clearly identified both in the sign on the equipment

MR. Eugene R. Riordan

16th February, 1966.

and at least two dozen times in the dialogue as HAL 9000. The HAL 9000 computer is clearly distinct from any IBM equipment seen in the film.

- (b) We have taken the precaution in protecting the IBM name of removing all planned IBM computer equipment from the space ship involved so that there can be absolutely no question about it being equipment other than IBM. Again, let me reiterate, the IBM equipment seen in the film functions perfectly and that there is never a moment's doubt about this perfection.
- (c) The break-down of the HAL 9000 computer is offset by disconnecting the computer and linking the mission with another HAL 9000 computer on Earth. It is this second HAL 9000 that clarifies the reason for the failure.
- (d) The first HAL 9000 computer, a voice input-output machine, breaks down because the machine planners made the mistake of programming the computer to provide false information. It's clearly shown that the computer involved is a machine whose goal in life, as a thinking machine, is absolute perfection and when it is programmed deliberately to lie encounters an unresolvable conflict that results in what is roughly equivalent to a nervous break-down. It becomes obsessively involved in an error concerning the failure of other equipment aboard the space craft and eventually becomes irrational in behaviour and must be disconnected. It is at that point that the second machine that was not given the unmanageable conflict takes over.

I do not see how we could have taken any more precautions than we have to protect the IBM image. I hope this letter clarifies for you the situation and I hope that it will cause you no further concern.

Mr. Eugene R. Riordan

16th February, 1966.

Our operation here is available to you and any member of IBM just as it has been to Elliott and to Ernie, and I sincerely hope that you will recognise that we have at all times endeavoured to keep faith with you.

The nature of the equipment failure was suggested to us by scientists from M.I.T. who visited here and pointed out to Stanley that it was highly probable that computers thirty-five years from now would be capable of nervous disorders if provided with unresolvable conflicts. We were assured that this anthropomorphism was not in the least out of keeping with probability.

Again, I hope that you will find in this explanation repeated assurance of our intent to protect the IBM name.

All the best,

Roger A. Caras.

September 13, 1966

Mr. Stanley Kubrick
Hawk Films Ltd.
MGM Studios
Borehamwood, Herts
England

Dear Stanley,

Here is your status report on IBM and the nervous computer:

Sometime ago I explained to IBM at great length the change in the script as effects HAL. To be absolutely certain that the situations was clear and in the open I called C.C. Hollister their Corporate Director of Public Relations again today and repeated the story going so far as to explain to him that HAL actually causes human deaths. I made it very clear, and this is completely true to the best of my knowledge, that the name IBM is never associated with equipment failure but that is is obviously not an IBM machine.

IBM'S position is that if IBM is not associated with the quipment failure by name they have no objection if it is decided to give screen credit to the advising companies (and I hope you do decide to do this) they will not object to getting screen credit as long as their name is buried in a list with others and they are not specifically listed as being technical advisor for the computer.

Stanley Kubrick

September 13, 1966

IBM has now been told of this situation three or four times and I honestly believe we have been completely honest with them.

By the way, they saw the Look film and are convinced of the films importance and size.

I trust this answers your question.

All the best,

RC/be

Appendix D

**Transcript of Francesca Jaynes talk on
Panel 2: Making Artificial Intelligence:
Francesca Jaynes at the Conference
'Kubrick: Designing Worlds conference' at
the London Design Museum on the 13th of
September 2019**

00:00:00:00 - 00:00:25:00 - Francesa Jaynes

You know, it's great to be here when you are inviting me. And the main reason I want to show the showreel was actually to show that both choreography and movement are needed in many different ways on many different productions and a dance sequence it's quite obvious that the choreographer has worked hard.

00:00:25:02 - 00:01:04:03 - Francesa Jaynes

And based on the stand, you know, the gravity, it's it's quite hard to explain what my job was on that. And I think with the robots in AI, it's it's it's a similar thing understanding what went on behind it to get to where you know what you've seen the film. So when I first met Steven Spielberg, it was to work with Jude Law and the brief was very clear.

00:01:04:05 - 00:01:34:14 - Francesa Jaynes

The idea was that Gigolo Joe would woo the women that he would see through the medium of dance. And because their idea was that humans feel really comfortable around the meccas they wanted to make them as human as possible. So if Gigolo Joe met a Japanese lady, he would break into Kabuki. If he met a Spanish lady he would break into Flamenco.

00:01:34:16 - 00:02:06:11 - Francesa Jaynes

And so what we did, first of all was I was with Jude in London over a period of weeks, and we worked on lots of different styles. We worked on Tango and Spanish. I taught in ballet too, because I thought I was such a fantastic face because it's we only had a few weeks, so it's not like I chose to a ballet dancer, but I was not clear how to stand properly how to do it.

00:02:06:13 - 00:02:33:18 - Francesa Jaynes

And we would work for a few days and then we would send the material over to the Steven in America, and then we would have a conference call. And it was decided that if you were going to design a robot as a dancer, then there needed to be a generic movement so that when Gigolo Joe was walking down the street, when he opened the door, when he sat down in the chair, that he would look like a dancer.

00:02:33:23 - 00:03:02:02 - Francesa Jaynes

So we worked on Fred Astaire, and then we moved on to Gene Kelly. And there was something about Gene Kelly's movement, a very seductive dude. So Gigolo Joe's generic movement is based on Gene Kelly, and every time he met somebody, he would move his hand, He would look at himself. Music would come from his shoulders, appropriate music to dance with the women that he was wooing and we repeated this sequence, so it just became passe.

00:03:02:04 - 00:03:35:18 - Francesa Jaynes

And now, unfortunately, we don't see a lot of that work in the film. And Steven said to Jude that he he really loved it. But the film was quite lengthy and there just wasn't room for all those meetings with these women. But I of course, I was disappointed when I saw the film, but I know that we haven't worked as hard as we did.

00:03:35:20 - 00:03:59:22 - Francesa Jaynes

Do we look like he dances in the film? We just won't be done right. So I kind of have to trust that the process will work for me in some way. When I first met Steven [Spielberg] in London and we talked for hours about dance, as you can imagine, his knowledge of everything in life is vast and his knowledge of dance is vast.

00:03:59:22 - 00:04:23:07 - Francesa Jaynes

And we talked about the Hollywood musicals. We talked about vaudeville and musicals. And it was yeah, it was really important to him. But do you like many directors, the actors are so important that they have to feel comfortable. So it's important that we got on and that we can find a way of working because it's intense working with one person physically, all day anyway.

00:04:23:10 - 00:04:46:23 - Francesa Jaynes

So what he did say to me was that the other robots, the other mechas were being the actors who were playing them were going to work with somebody else in L.A. So I didn't have to worry about that. I didn't have to work with David. And then it was playing with Haley was playing a little boy because he was the sort of the best generation of robots.

00:04:46:23 - 00:05:04:04 - Francesa Jaynes

So he didn't need to he wanted to look like a human. So two days before about fly out, I got a call from one of the producers saying that the person who was in L.A. who was going to work with the other robots was not going to do it anymore. Don't know. No idea why. It wasn't very important.

00:05:04:04 - 00:05:31:04 - Francesa Jaynes

So that you'll be doing it is what they said, which is a very American thing to say. And it can be really positive because you just go, Oh, okay, well, I'm going to have to find a way of working that out. So because the brief for Jude has been so clear, I thought that I would have a similar conversation with Steven about how we were going to approach the movement for the other meccas and that never happened.

00:05:31:06 - 00:05:54:15 - Francesa Jaynes

So I sort of made it up and I thought, okay, what? What do I know? I know there are jobs. Every robot, every actor playing a robot has a job. So that's my way in. So I looked at the jobs and I knew that they were going to be discarded by their owners because of some malfunction. Now, we didn't read the script.

00:05:54:19 - 00:06:19:00 - Francesa Jaynes

I was having this conversation with the producer the day before I flew out with no script. So what she did tell me what the jobs were. So I said, okay, right. So if you got a butler then he can't bent forward so he can't do his job and she said yes, yes. So that's it. So when I got over to L.A., I sort of work down and the jobs were their idea so they could be excited.

00:06:19:02 - 00:06:43:08 - Francesa Jaynes

Was it? If we could design robots, get them to do we would get them to do the jobs that we don't want to do. So it included things like a road , a road worker and the drone just 24 hours a day just for the drone. There were teachers, there was a chef, there was an accountant, there was a chauffeur, there was a comedian, there was a prostitute.

00:06:43:10 - 00:06:54:14 - Francesa Jaynes

So I took every job and worked with the actor and we worked out with a sequence that was probably about 30 minutes to a minute of the job when they had everything working. So with the chef, it was, okay, you take out a bowl, you take out eggs to make a cake. We worked it out with a nanny.

00:07:02:02 - 00:07:22:04 - Francesa Jaynes

You pick up the baby, you got the baby in your arms and at the same time, time I worked on focus exercises because I knew that there was not robotic movements. You know, you can see a dance where they have robotic movement

that's not what I knew that that's not what this should be. But what it is, it's focused.

00:07:22:06 - 00:07:52:14 - Francesa Jaynes

There is no they are designed for maximum efficiency. Therefore there is no extraneous reasons. at all. I thought that's a little bit like an animal. If somebody were to walk through the door, I would turn. I would turn. But I've taken in colors and faces. An animal wouldn't do that. They'll go straight to it. That's what a robot is designed to do. So if an accountant has to pick up a pen, he'll go straight to the pen and he'll come back.

00:07:52:16 - 00:08:22:08 - Francesa Jaynes

So we started off working on that movement. So every robot slowly to account and then I just did it so that it was faster, and faster and faster, so that they were doing all their movements that was not needed. And you look at it and you go, Yeah, that is weird. It's not robotic, but it's not human. And so then we took something away.

00:08:22:10 - 00:08:46:23 - Francesa Jaynes

Some of them knew already that they might not have an arm or an leg, and actually some of the actors didn't have an arm or a leg, and the chef knew that he was going to have all his space removed. It's going to be blue screen. And so we did the same thing. We went through the job. But with this this disability, to see how that would work.

00:08:47:00 - 00:09:08:09 - Francesa Jaynes

And the other thing I knew was that they were going to have to stand still for a long time and that they were going to have to run. So again, we went back to sort of an imagined design for the robot. So if you're an accountant, you're probably going to sit down a lot. You're going to have to put figures into some kind of ledger so that right the hands and the fingers are going to be really dexterous.

00:09:08:09 - 00:09:33:03 - Francesa Jaynes

But maybe their legs, they have to walk because they might have to move to a filing cabinet, but they're not going to have to run down the road. So again, so once we decided that, I said, okay, right, you stand up, imagine that your legs that quite heavy because they don't work that well. Now walk. So the actor would walk and I did that with every character.

00:09:33:03 - 00:09:55:10 - Francesa Jaynes

So like the nanny, I thought, okay, so the nanny actually needs to be quite fluid because she's been quite calm and but she would have been designed to run really fast because she might have to run on to choking. So that's how we built the movement up. And I think, again, you don't see a lot of it in the film.

00:09:55:12 - 00:10:28:05 - Francesa Jaynes

It would be quite hard. But when you do things and you see them starting in, they know there is something going on behind it. I think, which again is hard for me to to quantify, but I know that we haven't had done all that work. It wouldn't have worked so well. When you do see those scenes and when the when they get into the woods and they're trying to fix themselves because that's what robots do they have to continually do their job to whatever they've been programed to do.

00:10:28:07 - 00:11:06:17 - Francesa Jaynes

So they're there and they pick up the mantle and see if that will work as an arm, or pickup an eye and see what will work. And it just gave them and I think all that work gave them gave them a character like a physical character, a language that they could then use in any situation. I hope that makes sense. And I think that.

Appendix E

List of Publications

Three papers and a research report by the author have arisen from this PhD.

1. A report that concludes a two-year research grant examining the role of technology in creating new relationships between the user, the city, and the environment. It stems from my PhD research and serves as a testing ground for practical investigations related to my topic.

Marechal, N., Chou, S.F. (2025). Towards a pluralistic approach to intelligent building: beyond function and automation and towards a new relationship between the users, the city and the environment [Research Grant: III-2410-H-035-057-MY2]. National Sciences and Technology Council of Taiwan.

Chapters 5, 7, and 8 have been presented at conferences spanning the fields of Science and Technology Studies (10th STS Italia) and Design through critical technology (Academic Mindtrek Conference), and philosophy of design (DRS Conference).

2. Marechal, N. (2025). Reconfiguring technology through the study of film prop: the case of Dr Strangelove and his glove [Paper Presentation]. 10th STS Italia, Politecnico de Milano, Italy.
3. Marechal, N. (2025). A cosmopolitical compass to challenge the future development of social robotics. In Proceedings of the 28th International Academic Mindtrek (Mindtrek '25). Association for Computing Machinery, 42–52.
<https://doi.org/10.1145/3757980.3757993>
4. Marechal, N. (2026). Rethinking our relationship with technology through the translation of a film prop: The case of Pyle and his rifle. In Proceeding of the 26th Design Research Society conference (DRS 26). <https://doi.org/10.21606/drs.2026.683>

Glossary

Actants	Designates a particular entity – human or nonhuman – which acts within a narrative of network-building. In this this thesis, film actors, characters, performance props (Chapter 5, 6) and enacted technologies (Chapter 4, 5, 6, 7) are actants.
Actor-network	Heterogeneous network of aligned interests. In this thesis, it includes writers, directors, film actors, characters, and the technological props on the set or in the film. The real and fictional networks are aligned as two versions of the same reality (see Chapter 6).
Amodernity	According to Latour (1993a), modernity is characterized by the ostensible separation – or purification – of the human and nonhuman. However, humans have always already been embroiled with nonhumans. We are thus located in amodernity in which humanity is necessarily marked by hybridity (see Chapter 7).
Black box	All that is of interest is the input and the output. In this thesis, technological props typically function as black boxes until an issue arises that requires them to be opened.
Boundary objects	Objects that operate across multiple networks. According to Trompette & Vinck (2009), the boundary object is multiple: abstract and concrete, general and specific, conventional and user-adapted, material and conceptual (a database, a protocol). It is a partial and temporary bridge which is fairly unstructured when used jointly and highly structured when used within one of the worlds involved (see Chapter 5).

Collective	An alternative to the word society that focuses on the association between humans and non-humans.
Composition	Composition refers to the gathering and combination of heterogeneous actors and entities to produce a new entity, a particular reality. In this thesis, technological relatedness is a composition.
Cosmopolitics	Cosmopolitics is concerned with bringing together the disparate practitioners and practices that contribute to the emergence of an issue at stake. Practitioners can be both 'loyal' to the objects of which they speak, but also recognise that these objects are composed (see Chapter 8).
Durability	Denotes the continuation of a network through a variety of means, notably the movement of intermediaries continuously and faithfully repeating a given message and in the process replicating, normalising and perhaps standardising roles, associations and their distribution. In this case, cinema often contributes to the durability of technological objects (see Chapter 6).
Enactment	Enactment and enact fulfil similar functions to performance and perform. Both reference the ways in which discourses, practices, technologies or bodies act in ways to construct and distribute a particular reality. For Mol (2002) the advantage of enactment and enact is that they do connote a central 'performer' or a reality behind the performance (see Chapter 7).
Hybrid	The world is composed of hybrids – mixtures of humans, natures and technologies, rather than thinking in terms of humans versus nonhumans.

Mediation	The mediation of objects described by Latour in many ways such as link (1987/1991), influence (1990), chain (1992), association (2005), and subsistence (2013). Drawing on Callon & Law, I use the notion of relay (1997).
Power	In ANT power is not a term much used, because it detracts from the close analysis of how associations are formed. Rather than observing power being exercised by one actor 'over' others, ANT traces the local processes of translation, enrolment, etc. which produce and sustain relations. These relations might evoke power, in the sense that they are 'hierarchical', but they can also be subverted at any moment.
Performativity	This term addresses the ways in which practices produce particular realities or ontologies. How a reality is performed can also induce others to share this reality. In this case, films as a laboratory can contribute to the performativity of a technology by enacting it. This is also true of film actors, whose performances contribute to the production of a particular reality concerning technology (see Chapter 6). Additionally, performativity dissolves the distinction between reality and fiction, shifting the focus from ontology to action.
Prescription	Technologies have 'scripts' integrated into them which affect what can and cannot be done with those technologies. They prescribe or proscribe the behaviours or comportments necessary to ensure that they work.
Reconfiguration	The question of how it might be otherwise, both in the staging of human-machine encounters and through the reconfiguration of relations, practices, and projects of technology design and use (Suchman, 2007).

Scripts	Scripts are the ‘instructions’ or ‘rules’ inscribed into technologies that must be followed if those technologies are to work. The script also examines the behaviour imposed back onto the human (Akrich, 1992).
Situated action	Situated action is the idea that every predetermined course or plan is dependent on its material or social circumstances. It is difficult to understand human activity without first examining its context and culture, rather than an individual artefact (Suchman, 2017) (see Chapter 7).
Technology-in-making	Describes the process and practice through which technologies are developed, shaped, and understood. This concept emphasises the situated and emergent nature of technological development, acknowledging that technologies are co-constructed (Suchman, 2002).
Translation	In Latour’s technical mediation (1994), this is the enrolment of actors into a network using a program of action. In this thesis, it is the act of identifying the performative relationship between an actor and a technological prop and subsequently attempting its reconfiguration into a technology of relatedness (see methodology).
Program of action	Refers to the intentions of human beings and the functions of artefacts.

Unless indicated, the glossary is adapted from the Selective Glossary of ANT and Post-ANT terms (Michael, 2017), available online <https://sk.sagepub.com/books/actor-network-theory-sk/back-matter/i546.xml>

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