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FORESEEING THE UNFORESEEN SOCIAL DIMENSIONS AND IMPLICATIONS OF AI DIGITAL HUMANS IN RETAIL

A thesis presented in partial fulfilment of the requirements for the degree of

Doctor of Philosophy in Marketing

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Statement of Academic Integrity

This thesis is the product of my own work and has not been taken from the work of others, and the work to which it refers is the result of my own efforts. When the work of others has been used, it has been fully identified through in-text citation and appears within the reference list. This thesis has not been submitted in whole or in part for any other academic degree or professional qualification.

Publications associated with this thesis

Published Journal Paper

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Abstract

The overall focus of this doctoral thesis was to broaden the theoretical and practical understanding of the social dimensions of Artificial Intelligence (AI) within a retail context. Specifically, this thesis unpacks the social dimensions that determine consumers' experiences with AI digital humans (henceforth AIDHs) and unravels the social implications of the technology that may be unforeseen at this preliminary stage of the AI retail revolution. While retail technologies are widely accepted as impacting consumers' shopping practices, a review of the relevant retailing and consumer literature indicates a lack of knowledge and emphasis on AI consumer-facing technology's social implications and dimensions. There is also a noticeable paucity of research that considers consumers' actual experiences with AI retail technologies, despite consumers being the ultimate end-users of AI service encounters. Retailers are increasingly investing in advanced AIDH systems globally, however, scholarly insights into the social implications of leveraging the technology within a retail context are limited.

This thesis seeks to address this problem by interrogating consumers' experiences and perceptions of retail AIDHs to construct the theoretical foundations that illuminate shopper's needs in relation to AIDHs, clarify how the technology socially influences consumers' shopping practices, and unpack the ensuing social implications.

Three overarching research objectives were built to accomplish this aim.

Objective 1:

To capture the complexities and dynamics of consumer experiences with AIDHs, focusing on the critical social themes underpinning consumers' interactions with the technology.

Objective 2:

To derive a sociologically informed understanding of the meanings that consumers associate with favourable and unfavourable AIDH interactions and to investigate how these meanings may form the basis of a broader social implication in the form of a shopper-based novel Digital Matthew Effect.

Objective 3:

To understand how consumers comprehend AIDHs, particularly whether retail AIDHs are perceived as social actors and whether interactions with the technology are social experiences. Also, to reveal and make sense of any consumer confusion that may ensue when attempting to comprehend these AI objects.

This thesis presents three distinct research articles, each acting as a fragment of the central research agenda by exploring one of these objectives. The papers are discovery-orientated in nature and draw on practice-informed, ethnographic research to develop a richly contextualised understanding of consumers' shopping practices with AIDHs in a naturalistic setting. A multi-method qualitative approach, underpinned by an interpretivist epistemology, is adopted. A series of activities are conducted, including consumer in-store observations, interviews (depth and intercept) with consumers and retail managers, and a media content analysis.

The findings show that social dimensions play a pivotal role in consumers' experiences with AIDHs and that the technology has a profound social impact on its users. The social dynamics of consumer-AIDH interactions produce social possibilities and challenges that affect the process of consumers integrating AIDHs into their shopping practices. A typology of nine social elements of retail AIDHs is proposed and discussed. The findings contribute to an emerging academic conversation that explores the shift of retail technologies from task-orientated machines towards their

role and function as social actors within shopping environments. This thesis demonstrates how consumers use, and would like to use, AIDHs within their shopping practices to provide practical suggestions for the design and implementation of retail AIDHs as the technology continues to advance over the coming years. The insights derived from this thesis are necessary for promoting positive consumer experiences with AIDHs, as well as mitigating unwanted repercussions, and therefore lend themselves to practical suggestions for the retail industry, which are discussed. I conclude this thesis by offering a research agenda that aims to build the foundation for a successful widespread application of AIDHs within retail over the coming years.

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Chapter One: Introduction

1.0 Overview

Chapter one introduces the thesis by outlining the background information that motivates and contextualises this study. The chapter begins with a description of the central research topic and an explanation of the significance of this study. It summarises the relevant literature, describes the objectives, methodology and theoretical lens employed within the research, and introduces the three papers that constitute this thesis. The chapter concludes by detailing the structure of the thesis.

1.1 Significance of this thesis

This thesis aims to broaden the theoretical and practical understanding of the social dimensions of Artificial Intelligence (AI) within a retail context. Specifically, this thesis unravels the social dimensions that determine consumers' experiences with retail AI digital humans (henceforth AIDHs) and the social implications of the technology that may be unforeseen at this preliminary stage of the AI retail revolution. This is important as the extant consumer-facing AI retail literature tends to take a psychological orientation that divorces the social context from the consumption situation and therefore delimits an understanding of implications that are social in nature. Consequently, to my knowledge, no study has acknowledged or explained the social implications that emerge when AIDHs are integrated into physical retail environments. Thus, the purpose of this thesis is to provide empirical evidence that supports several propositions pertaining to the social significance of AIDHs in retail. This study builds towards a typology that isolates and organises nine retail AIDH social elements into two categories. (1) The social dimensions that impact consumers' experiences with AIDHs in retail, and (2) the social implications of the technology. The scholarly research presented within this thesis will utilise the theories of social practice theoretical lens (also known as practice theory). The practice

theory approach is difficult to characterise as it is not defined by a specific theory. It is complex and nebulous in its structure. However, it will be explained and unpacked towards the end of chapter one (section 1.5).

It is now widely believed that, given the rapid advancement and implementation of AI in service organisations, economies are now braced for a digital service revolution that is analogous to the industrial revolution that began to radically change the world two centuries ago (Wirtz et al., 2021; Grewal et al., 2017). As retailers continue to pursue innovative ways of blending the digital and physical shopping channels, consumer-facing AI technologies have swept through the retailing arena (Noble et al., 2022), evolving shopping environments, humanising technological interactions in-store (Hoyer et al., 2020), and shaping the nature of shopping experiences and practices (Reis et al., 2020). The social nature of service encounters is now transforming from what was previously considered a ‘game of humans’ (Bowen, 2016) to a more autonomous and technology-dominant practice (Larivière et al., 2017), creating novel opportunities, as well as challenges, for both consumers and retailers. With this expeditiously improving cutting-edge technology becoming more competent, smaller, superior, and cheaper, it is now widely predicted to remould virtually all aspects of the service sector (Wirtz & Zeithaml, 2018). As retailers seek more creative and profitable uses of their physical shopping spaces through AI investments, the ways in which consumers experience service and the social nature of shopping practices have begun to fundamentally change (Bolton et al., 2018). This, therefore, provides the impetus for this thesis.

AI refers to a machine, algorithm, computer system, or network capable of exhibiting characteristics of human behaviour and intelligence (Huang & Rust, 2018). Through the amalgamation of several contemporary technologies (neural networks, machine learning, 3D graphics modelling, natural language processing, camera, sensors, etc.), AI has now taken the form of various consumer-facing service delivery systems. Of particular interest within the brick-and-mortar retail space is the recent emergence of AIDHs (Kaplan & Haenlein, 2019), such as, for example, Singtel’s

AI automated consumer service agent named 'Stella', who is now engaging consumers within their stores. An AIDH is an AI-generated human-like avatar capable of engaging in reciprocal communication autonomously and naturally with consumers through a conversational interface (Puntoni et al., 2021; Loveys et al., 2020). Retailers are now investing heavily in AIDHs as a unique and engaging approach to customer service (Miao et al., 2022), with these AI avatars projected to grow by 35% annually (Newswire, 2019).

The purpose of AIDH technology is to personify AI by resembling lifelike personalities that emulate the form, features, and social/emotional nature of a human being while enacting complex communicative attributes such as tone of voice, body language, and facial expressions (Collier et al., 2019). AIDHs are, therefore, not comparable to traditional consumer-facing retail technologies that retailers are now familiar with (e.g., self-service checkouts). As such, retailers find themselves in a period of technological transition (Garvey et al., 2023), contemplating consumer-facing AI agents that are now at their fingertips without any certainty of how they can be incorporated into their strategies and, possibly more importantly, how their consumers will react (Inman & Nikolova, 2017).

Dominant thought proposes that the deployment of technology into retail frontlines enhances service delivery by improving the convenience and efficiency of the shopping process (Bitner et al., 2002; Wunderlich et al., 2013; Pantano & Viassone, 2014; Roy et al., 2017). AI technologies, in particular, are thought to offer substantial benefits to retailers (Huang & Rust, 2018) and are being deployed to enhance the shopping environment, lower labour costs, and differentiate stores (Larson, 2019). However, the failure of several previous in-store technologies, such as the Videocart in the early nineties (Inman & Nikolova, 2017), has demonstrated that attempting to capitalise on technological trends without a robust understanding of the innovation from the consumers' perspective can provoke unwanted and unforeseen repercussions (Sorescu et al., 2011). Moreover, the tendency of AI software developers to prioritise technical excellence may discount the social

complexities of the contexts in which retail AI technologies are deployed (Puntoni et al., 2021), thus subverting consumers' experiences with the technology.

Despite the rate at which retailers pursue investments into advanced AIDHs globally, scholarly insights into the implications of leveraging the technology within a retail context are limited (Marinova et al., 2017), as is typical for an emerging research area. For instance, how consumers experience AIDHs in-store and how the technology influences shopping practices is not currently understood. When confronted with an AIDH, consumers find themselves in the unaccustomed social situation of comprehending and engaging with a technological object that appears, sounds, behaves, thinks, and is framed as a human being. Again, little is known about how consumers may react socially to this social-technological object and how the social context of retail environments determines consumers' experiences with AIDHs. Furthermore, the growth of the multifaceted uses of AI in retailing and the substantial shopping benefits that AI can provide consumers presents several broader societal concerns, including the potential inequitable distribution of shopping outcomes resulting from differing levels of consumer adoption and effective usage of such technologies (Dwivedi et al., 2021). Understanding the implications of AIDHs at the shopping practice level may offer preliminary insights into the central elements behind wider societal inequalities arising from the technology within a consumption context.

Reeves and Nass (1996) imply that complex contemporary technologies provoke confusion in the minds of humans as we have not developed at a rate conducive to comprehending advanced technologies with any certainty. Despite this, consumers now find themselves attempting to perceive one of the more obscure consumer technologies (AIDHs) within their shopping environments, establishing a context for potential confusion. Consumers who experience confusion, such as the uncertainty that may arise from exposure to an in-store AIDH, for example, tend to develop perceptions of risk, avoidance tactics (Turnbull et al., 2000), decision paralysis (Mitchell and

Papavassiliou (1999), reduced loyalty (Walsh et al., 2002), and have been shown to spread unfavourable word-of-mouth (Mitchell & Papavassiliou, 1999). From a managerial perspective, confusion of this nature needs to be understood and managed (Edward et al., 2012).

Against this background, there is a clear need to broaden the theoretical and practical understanding of the dimensions and implications of AIDHs within retail. Given the unique and unexplored social aspect of this in-store technology, elements of a social nature are of particular interest. Therefore, it is necessary to explore consumers' practices with AIDHs within their specific shopping environment, dissect their experiences and perceptions of the technology, and develop an understanding of the social significance of AIDHs in retail. Such an enquiry appears necessary to promote positive consumer experiences with AIDHs and mitigate unwanted repercussions. The following section offers an overview of the relevant theoretical terrain, focusing on the areas of research that extant literature is yet to contend with. These theoretical gaps will form and justify the three core objectives of this thesis.

1.2 The Theoretical Terrain - Theoretical Gaps

The theoretical discussion of AIDHs in retail is nested within a broader emerging body of research that has shifted the academic viewpoint away from retail technologies as merely task-orientated machines and towards recognising their function of creating social and emotional connections with consumers. The past five years have seen scholars contemplate the concept of social retail technologies. In doing so, several AI technologies have been explored within the retail context, including service robots (Niemelä et al., 2019), chatbots (Jiang et al., 2022; Crolc et al., 2022; Araujo, 2018), voice assistants (Huh et al., 2022), and AIDHs (Garvey et al., 2023; Miao et al., 2022; Silva, & Bonetti, 2021). These studies have primarily attempted to understand the role (Wirtz et al., 2018; Van Doorn et al., 2017), adoption (Nam et al., 2021; Park et al., 2021; Song et al., 2022; Silva &

Bonetti, 2021), consumer outcomes (Garvey et al., 2023) and interaction quality with these technologies (Ameen et al., 2021; Daqar et al., 2019; Kim et al., 2019; Mende et al., 2019).

Despite some scholars suggesting that social challenges may arise for consumers when AI technologies are deployed (i.e., Puntoni et al., 2021), literature is yet to investigate the social implications afforded by consumers' interactions with retail AIDHs and how consumers' experiences are consequently affected. More broadly, a noticeable paucity of research considers consumers' actual experiences with a digital human avatar as the frontline employee (Robinson et al., 2020), despite consumers being the ultimate end-users of such AI service encounters. This partly results from the limited range of methodological approaches utilised in existing literature, which tends to privilege consumers' perceptions, often pre-use, of retail AI rather than practices with the technology (Verhulst et al., 2020). This has led to calls for alternative methodologies to capture the complexities and dynamics of consumer experience (Kuppelwieser & Klaus, 2021), such as the critical social themes underpinning consumers' experiences with AIDHs. This forms the first core objective of the current thesis.

Objective 1:

To capture the complexities and dynamics of consumer experiences with AIDHs, focusing on the critical social themes underpinning consumers' interactions with the technology.

The social implications of AIDHs may not be limited to the consumer experience, as the response to the unimpeded potential and exponential growth of AI retail technologies has provoked a call for research into AI's implications at the societal level (i.e., Joyce et al., 2021). One such concern is the potential for broader structural changes, such as social inequalities that may arise with an unequal usage of AI as a shopping tool (Dwivedi et al., 2021). This requires scholarly attention to understand and prepare for, which is severely limited within a consumer context. While some

researchers argue that retail consumers are the undeniable winners in the competitive race to leverage AI in a consumer setting (Byrum, 2018), others warn of potential social ramifications (Mahmoud et al., 2020). Literature of this nature has predominantly concerned itself with a lack of human-interaction in-store (Ameen et al., 2021), irritation caused by the technology (Rodgers et al., 2021), and an increased requirement for consumers to share private information (Mahmoud et al., 2019). However, negative social issues pertaining to AI-powered consumer experiences remain relatively unknown (Shankar, 2018), including the potential of novel Digital Matthew Effects.

Considered by some to be the missing piece of the puzzle in understanding the social implications of disruptive innovations (i.e., Rigney, 2010), a Digital Matthew Effect, also referred to as a digital divide, occurs when a technology awards disproportionately advantages to some members of society (Van Dijk, 2006). This concept has been appropriated as a framework for studying social outcomes and inequalities that emerge in conjunction with the unequal access and effective usage of several modern technologies, e.g., the internet (Van Deursen & Van Dijk, 2011). Concurrently, the Digital Matthew Effect provides a useful theoretical angle for exploring the existence and nature of potential shopper inequalities derived from AIDHs within retail stores.

Extant research has shown that in-store technologies do not have homogeneous appeal (Koronowski, 2010) and suggests that certain consumer groups are more likely to use retail technologies effectively and therefore reap the associated benefits than others (see, 'Diffusion of Innovations' in Rogers, 1995 and 'Technology Readiness Model' in Parasuraman, 2000). A significant body of research has investigated the demographic consumer groups more likely to adopt and disproportionately benefit from in-store technologies (Lee et al., 2010; Meuter et al., 2003; Weijters et al., 2007). However, such research does not acknowledge how the complexities of the social contexts that interactions with retail technologies take place within that may draw and repel consumers. Nor does it consider the interplay between differing consumer elements such as

dispositions, motivation, and skill level, which may ensure some consumers infuse AIDHs into their shopping practices, and reap the benefits of the technology, while others do not. Less understood is a more sociologically informed understanding of the meanings consumers derive from favourable and unfavourable AIDH interactions and how these meanings may form the basis of a novel digital divide. Furthermore, extant literature has yet to investigate the Digital Matthew Effect in conjunction with a retail technology that offers shopper advantages to the extent that AI does, prompting Carter et al. (2020) to call for research on the emerging AI divide across disciplines. This sets the theoretical scene for investigating the potential of a consumer-based digital divide driven by the implementation of retail AIDHs. This, I argue, provides an additional opportunity to contribute to the theoretical developments of AI in retailing and introduces the second core objective of this thesis.

Objective 2:

To derive a sociologically informed understanding of the meanings that consumers associate with favourable and unfavourable AIDH interactions and to investigate how these meanings may form the basis of a broader social implication in the form of a shopper-based novel Digital Matthew Effect.

A further gap in contemporary retail research relates to limited theoretical awareness of how consumers who have experienced an AIDH perceive and comprehend the ambiguous nature of the technology. Reeves and Nass (1996) and several other Computers as Social Actors (CASA) theorists drew attention to humans' inability to comfortably grasp complex contemporary technologies. From a retail technologies perspective, this establishes questions about consumers' ability to perceive AIDH technology with any degree of certainty, and if not, the existence and nature of confusion that may ensue when attempting to comprehend the technology during interactions at retail stores. Despite confusion drawing the attention of several researchers across a variety of consumption settings (Walsh et al., 2010; Edward et al., 2012; Rafiq et al., 1996; Matzler et al., 2005) due to well-

established detrimental outcomes for both the consumer and retailer (see, for example, Turnbull et al., 2000; Mitchell & Papavassiliou, 1999), how consumers perceive AIDHs and the nature of consumer confusion that may result when attempting to comprehend these obscure objects remains unexplored.

The central contribution of the CASA paradigm came in the form of insights into how humans respond to computer programmes, that humans can perceive and treat computers as social actors to an extent (Nass et al., 1995; Reeves & Nass, 1996). What followed was a series of investigations that reported on humans' social relations with several computer programmes (Lee, 2010; Antos et al., 2011; Hong & Sundar, 2011; Eyssel & Hegel, 2012), including a recent and emerging body of research into social retail technologies (Van Doorn et al., 2017; Niemelä et al., 2019; Jiang et al., 2022 Huh et al., 2022; Silva, & Bonetti, 2021). However, to the best of my knowledge, no study has yet to explore this unique human perception intricacy with a computer that has the technological elements of a modern AIDH (i.e., AI software, sophisticated graphical representations of a human face, natural language processing, a well-developed digital personality etc.) within a retail context. Nor is there any research that connects this social phenomenon with the potential confusion discussed above. Consumers' social confusion, if any, when confronted with an AIDH within their in-situ retail environments is not yet recognised or understood.

A central component of engaging socially with technology is physical and cognitive anthropomorphism – attributing human-like characteristics and traits to non-human objects (Kim & McGill, 2011). Nonetheless, little research has explored consumers' physical anthropomorphism of retail AIDHs, and cognitive anthropomorphism is entirely absent from the retail AIDH literature despite the technology specifically designed to evoke this effect. The extent to which a non-human object is perceived as anthropomorphic indicates its degree of social presence (Nass & Moon, 2000).

Whether consumers anthropomorphise AIDHs, particularly from a cognitive perspective, and how this might shape social responses to retail AIDHs remains unclear.

The functional consumer responses to retail AI agents have been investigated to some extent, for example, the interesting discovery from Garvey et al. (2023) that consumers respond more negatively (purchase likelihood, satisfaction) to a worse-than-expected price offer when a human administers the offer than an AI agent. However, social consumer responses to these AI objects are yet to be accounted for despite the technology becoming more human-like and capable of more natural social interactions. Knowledge regarding the social norms and tendencies that govern how a human (a consumer) socially interacts with another human (an employee) is typically learned early in life. It is readily accessible to humans (Epley et al., 2007). However, such knowledge is lacking in interactions with inanimate objects (AIDHs) (Epley et al., 2007). Clarity regarding how consumers perceive and socially respond to retail AIDHs, including related confusion, appears fundamental for understanding the role of AIDHs within retail contexts and the social implications of the technology. This forms the third core objective of this thesis.

Objective 3:

To understand how consumers comprehend AIDHs, particularly whether retail AIDHs are perceived as social actors and whether interactions with the technology are social experiences. Also, to reveal and make sense of any consumer confusion that may ensue when attempting to comprehend these AI objects.

Despite attempts to understand the implications of AIDHs in retail, extant research has primarily adopted a psychological perspective (see, for example, Huang & Rust, 2018; Jeong & Ha, 2020), with far less being understood about the influence of the social context and the social opportunities offered by the technology as part of the in-store shopping experience. Consumer

researchers, more broadly, have tended to filter out the social elements of consumer studies, often treating social influences and outcomes as extraneous variables. Viewing consumers as having solitary experiences blinds researchers to much of the richness encompassing consumption and shopping practices, as social dimensions are an influential aspect shaping the consumption process (Ritson & Elliott, 1995; Ritson & Elliott, 1999). This informs the central direction of this thesis. The literature discussed in this section calls for an exploratory study into consumers' experiences with retail AIDHs, focusing on how social contexts may shape these technological interactions and how AIDHs may provoke social implications for the consumer. Herein lies this thesis's central research topic, which is further elucidated in the following section.

1.3 Overview of the Central Research Topic

From the onset of my PhD journey, a primary motivation was to build from a journal article that emerged from my Bachelor of Business Studies honours thesis. The paper titled 'Exploring the adoption of self-service checkouts and the associated social obligations of shopping practices' explores the adoption of self-service checkouts by consumers and offers a broader appreciation of how consumers engage with the technology. The study found that several social factors determine consumers' experiences with self-service checkouts. The paper also revealed some social implications of the retail technology that were, interestingly, not the intention of the technology. This ignited a curiosity concerning the surprisingly complex process in which consumers integrate retail technologies into their shopping practices and the idea that new technologies can produce unforeseen social implications.

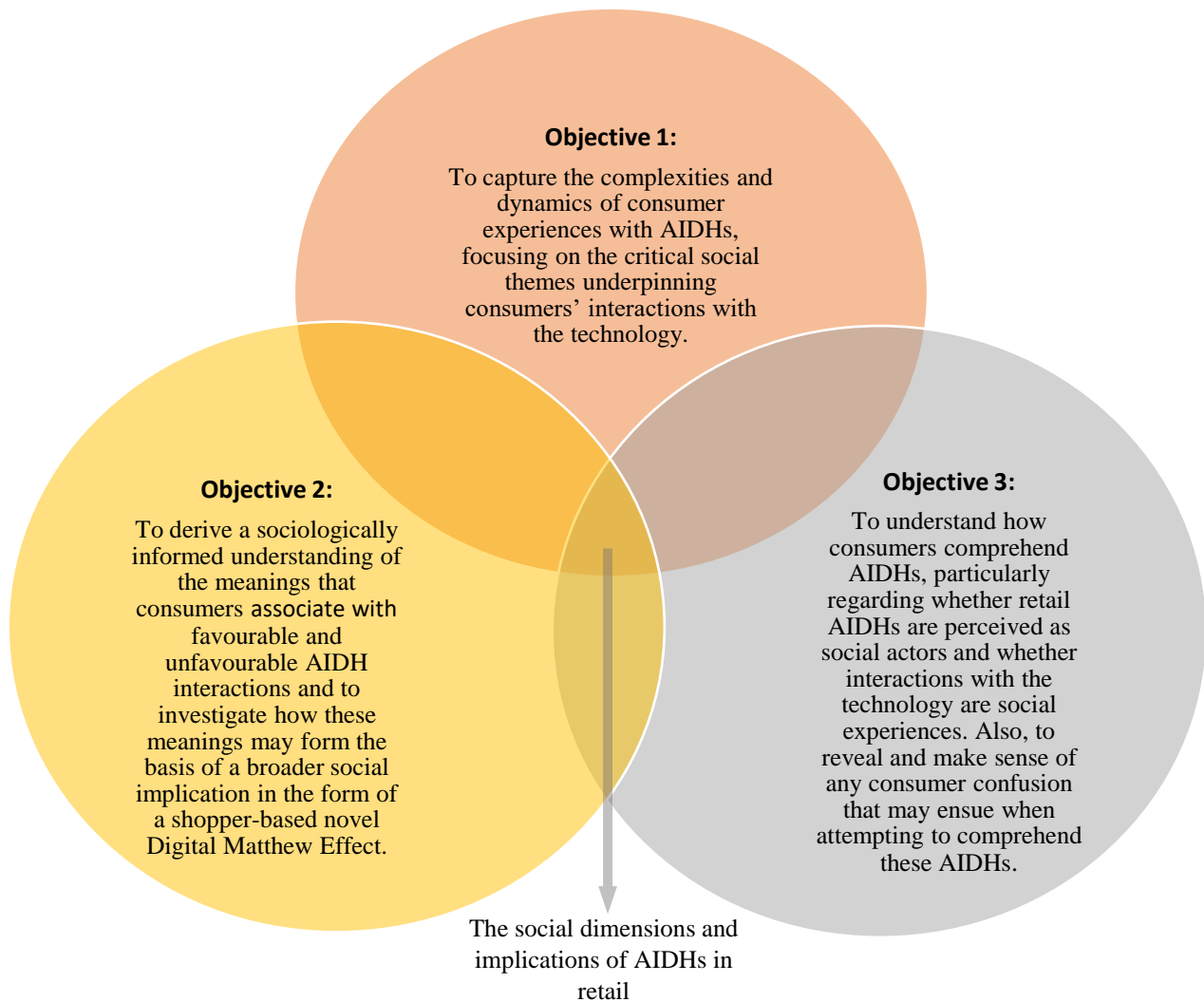
My research intention was, therefore, to deepen the current understanding of the use and outcomes of consumer-facing retail technologies. I started my PhD process wanting to develop learnings from my research into this relatively simple retail technology (self-service checkouts) and

investigate them in relation to a more advanced, cutting-edge, and socially significant innovation designed to affect the consumer journey on a larger scale. After reading articles by Bock et al. (2020), Martínez-Plumed et al. (2021), and Wirtz (2018), who suggest that AI is a far more transformative, disruptive, and complex technology when compared with other forms of consumer-facing technology, it was apparent that I should turn my attention towards retail AI. With AIDHs only beginning to appear within retail stores and the advanced nature of technology offering the potential of significant ramifications for the shopping process, AIDHs were selected as the focal technology of this doctoral research.

However, given the exploratory nature of this study, I was initially unsure of what elements would reveal themselves as central to the topic and how the study would develop over time. My interest in unintentional implications led me to conduct several contextual interviews with retail managers and AIDH designers to investigate how they believed the technology would influence the consumer. They spoke primarily about how the AIDH would offer a differentiated shopping experience, stimulate consumer engagement, and improve the quality of service by providing consumers with relevant information while guiding them through their shopping journeys. Following this, as well as my first read through the retail technology literature, I initially believed that AIDHs would significantly impact consumers' perceptions of service quality, particularly in relation to improved efficiency, as was the case in my self-service checkout research. I also assumed that consumers' evaluations and use of the technology would be centred around its functional utility. This did not eventuate. Instead, what I found when beginning to observe and speak with consumers was that the technology was more of a social stimulus and experience than expected, and that the implications of social elements were significant and in need of further investigation. My research process unfolded in a way that was not originally expected, and what were initially thought to be the central ideas now occupy only a small thread of the eventual narrative.

While the fundamental agenda of the thesis remains exploring AIDHs from the perspective of consumers who have experienced it within their shopping practices, I found the social function of AIDHs and the corresponding social implications to be a prominent and interesting dynamic. Thus, the primary research focus underpinning the three papers shifted towards understanding the social dimensions of consumers' experiences with retail AIDHs to develop knowledge that explains the ensuing social implications of the technology. This thesis unravels the social implications of AIDHs that may be unforeseen at this preliminary stage of the AI retail revolution and how social contexts may shape consumers' experiences with the technology. The social meanings consumers derive from the existence of, and experience with, AIDHs in a naturalistic shopping context will be investigated to broaden awareness of the social possibilities and challenges offered by retail AIDHs both in-store and from a broader societal perspective. This represents the central thread of the three papers presented within this thesis, each of which will explore one of the following core objectives (see Figure 1) and build towards understanding the social dimension and implications of AIDHs in retail.

Figure 1: Core Objectives



By appreciating the social implications of AIDHs, this thesis intends to offer a qualitative, sociological understanding of consumers' shopping practices with AIDHs, while extending the growing sociological-informed debates focusing on shopping and marketplace behaviours (Elms et al., 2016). This scholarly exploration means to provide unique and significant theoretical contributions to the retailing and consumption literature by uncovering the currently unforeseen and potentially unintended social implications of AIDHs in retail. The purpose is to provide direction for retailers, AI developers, and researchers to better leverage AI as a tool for enhancing consumers' shopping practices. This research offers practical suggestions to the retail industry, particularly for

tech-savvy retailers who have, or intend to, incorporate AIDHs into their frontlines. After all, a business investing in a transformational technology such as an AIDH is incentivised and would be inclined to take a set of actions that maximises the probability that it would improve their consumers' shopping experience while minimising the probability that it will be detrimental to their service offering.

To address this guiding research agenda, three distinct research articles have been produced, each exploring one of the three objectives. The following section introduces these articles, including why each of the sub-topics was explored and how each paper is connected through their attempts to understand the social significance of in-store AIDHs. An overview of the methodology used to conduct the three papers will then be outlined.

1.4 Paper Summaries:

1.4.1 Paper one

'The social significance of AI in retail on customer experience and shopping practices'

The motivation for paper one came from the results drawn from my honours thesis. This opening paper attempts to establish the theoretical foundation for understanding consumers' experiences with AIDHs, specifically the complexities that characterise the integration of the technology into existing store-based shopping practices. The intention is to reveal and untangle the social meanings and possibilities that result from AIDHs and explore how these may impact consumers' engagement with the technology as part of the shopping experience (objective one of this thesis). The retailing literature remains mostly silent on the social significance of AIDHs on the consumer experience, with this paper intending to offer a remedy. Paper one attempts to address the first objective of this thesis and is guided by four research questions:

RQ1: Which specific contexts and situations give rise to or are barriers to consumer interactions with AIDHs in-store?

RQ2: Which socio-material and technical assemblages lend themselves to successful and unsuccessful consumer interactions and experiences with digital humans in a physical retail setting?

RQ3: How, and to what extent, do such technologies become integrated within consumers' shopping and related practices?

RQ4: What are the social meanings and relations that emerge from consumers' interactions with AIDHs as part of the in-store experience?

While undertaking paper one, an interesting thread emerged within the data I had not previously considered, which was not within the scope of paper one. After talking to retail AIDH users about their experiences and observing consumers' responses to the technology in-store, it became clear that there was a divide between those who were drawn to the technology, and those who were not. This prompted questions regarding the specific elements that cause this divide and the potential for the technology to provide disproportionate shopping advantages for some consumers and not others and the subsequent broader implications. I decided that this was worthy of further examination. I reviewed the literature about inequalities that emerge in conjunction with new technologies and discovered a concept known as the Digital Matthew Effect that describes this phenomenon. This concept had been used to explore how some people are disproportionately benefited by innovations compared to others, so I related the Digital Matthew Effect with retail AIDHs to understand the issues that arose within my dataset. I collected additional data to supplement my original dataset as I wanted to understand the specific consumer elements and social contexts that may drive such an effect. This forms the basis of paper two.

1.4.2 Paper two

'Retail AI digital humans and the Digital Matthew Effect: A practice-based understanding'

The second paper, therefore, explores a broader social implication of this emerging technology by broadening the scope of the analysis to theorise how relative shopping inequalities may emerge between those who effectively embrace this transformational technology, and those who do not. I attempt to formulate a nuanced understanding of the complex favourable and unfavourable meanings that consumers afford to AIDH interaction and the contexts in which these arise. In doing so, I explore the diversity of consumers' responses to AIDHs to reveal the consumer dispositions, motivations, and competencies that draw and repel shoppers from successfully utilising and benefiting from retail AIDHs.

While existing research has emphasised the competitive disadvantage associated with businesses who are reluctant to adopt AI (e.g., Chatterjee et al., 2021; Oosthuizen et al., 2021; Sutton et al., 2018), very little attention, if any, has been given to the relative disadvantages imposed on consumers who resist AIDHs from their shopping practices. Paper two investigates how a Digital Matthew Effect may inadvertently emerge from retail AIDHs by understanding the intricacies that may form a divide (objective two of this thesis). The intention is, therefore, to reveal and understand a potential unintended social consequence (an AIDH based Digital Matthew Effect) of retailers' introducing AIDHs within shopping environments.

Paper two pursues four research questions that aim to reveal and understand the specific elements that may form this novel Digital Matthew Effect.

RQ1: Which consumer dispositions, skills, and motivations enable and prevent consumers from effectively using retail AIDHs?

RQ2: What are the meanings and perceived outcomes associated with favourable and unfavourable consumer-AIDH experiences?

RQ3: How do specific socio-spatial and temporal contexts lend themselves to consumers engaging and disengaging with AIDHs in-store?

RQ4: What are the social meanings and perceived outcomes that consumers derive from the existence of, and their experience with, AIDHs?

While the first two papers attempt to build an understanding of the social significance of AIDHs, this conversation felt incomplete without further exploring a primary and intriguing social theme that emerged within my dataset. Consumers were relating to the AIDH as if it was a human but also appeared to struggle with comprehending what exactly it was that they were interacting with whilst engaging with the AIDH. This tended to prompt an unusual form of socially induced confusion in response to this socially ambiguous technology, which had a unique implication on consumers' interactions with the technology. I wondered whether this phenomenon had been studied before, so I reverted to the literature and found a body of research into how humans perceive computer programs and how we tend to relate to human-like technology. I found that the extant research was yet to understand and account for the social complexities that I was observing. I then reviewed extant research into consumer confusion that was not within the scope of my initial literature review to understand what my dataset indicated. Like paper two, additional interviews were conducted that formed the basis of paper three.

1.4.3 Paper three

'A social mind fluster: How human is a digital human?'

Early in the data collection process, it became clear that ambiguity existed in the minds of consumers around what an AIDH is. Consumers were struggling to accurately perceive the AIDH obscuring technology interactions. By being allocated a human name, a gender, and a job title (e.g., customer assistant, sales concierge), AIDHs are deliberately designed to create the sensation of an independent social presence and to invoke social behaviour from their users. Whether or not consumers see a retail AIDH as a social actor and whether the interaction with the technology is perceived to be a social experience, I felt, was central to understanding the implications of the technology and worthy of a targeted exploration.

Paper three, therefore, focuses on the third objective of this thesis by attempting to capture how consumers comprehend and mentally process the concept of an AIDH. The purpose is to reveal and make sense of any social confusion with this technology and investigate consumers' perceptions of AIDHs, including whether consumers engage in cognitive anthropomorphism the technology and if it is perceived as being a genuine social actor. How this may shape how consumers engage socially with AIDHs is then explored.

From this, three research questions emerge:

RQ1: How do consumers perceive this unique and inherently ambiguous in-store technology?

RQ2: How and to what extent do consumers respond socially to an AIDH within their shopping environments?

RQ3: Do consumers experience confusion in relation to retail AIDHs? If so, what is the nature and causes of confusion?

The exploratory nature of this thesis uncovered social elements that relate to retail AIDHs that I did not initially perceive. Following the completion of paper one, I realised that additional key areas fell within my central research agenda. While writing the three papers, I continued to re-examine my

original literature review on the influence of AI retail technologies on the consumer experience while examining new bodies of literature to understand the unexpected threads that emerged. This is how paper one resulted in paper two, which then formed the need and motivation for paper three. This process reflects my overarching research philosophy by following the emergent trail of interest, which will be discussed in more detail in the following section.

1.5 Reflections on Methodology

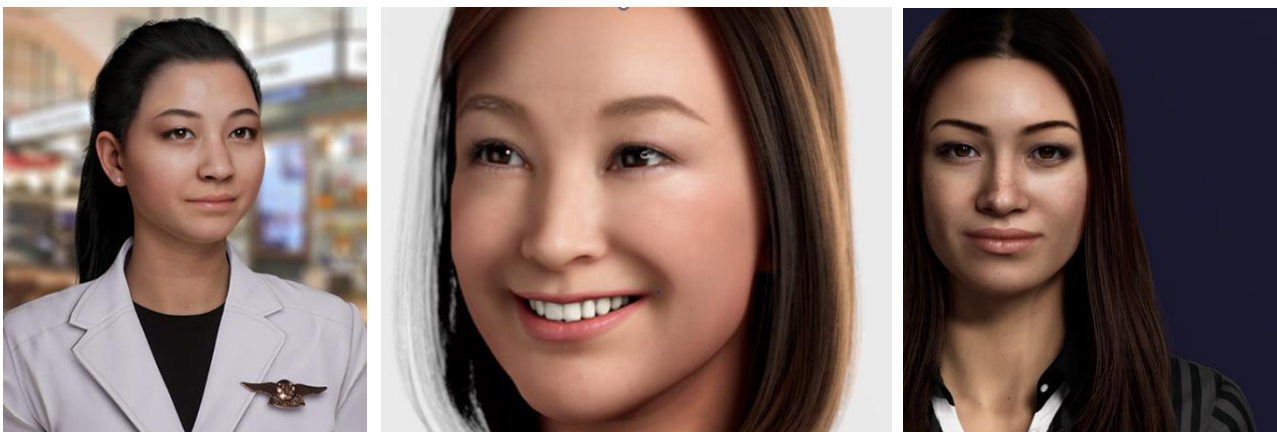
The methodology used within the papers and the specific case this thesis is based on will be explained in detail within each of the three papers. In summary, this thesis draws on ethnographic, practice-informed accounts of consumers' experiences with an AIDH within a single naturalistic setting. The discovery-oriented research goals of this exploratory consumer study inspire a qualitative research design and the selection of a multi-phase ethnographic approach. To allow for adaptation in response to new and unexpected ideas that arise throughout the research process, an emergent design underpinned by an interpretivist theoretical perspective was employed.

Permission was granted from an industry-leading technology and appliance chain in Australasia to study consumers' responses to their new AIDH frontline employee. Given the size and status of this retailer and that their AIDH was the first of its kind within the country, consumers' in-store experiences with this digital avatar provide learning opportunities for other retailers considering implementing similar technology within their stores. The selected retailer offers consumers a wide range of electronic devices, gadgets, home appliances, and related accessories and carries products from various brands. Products include a mixture of high-involvement items (such as computers, televisions, ovens, etc) and low-involvement items (such as phone chargers, ink cartridges, electric fans, etc). The typical shopping script that consumers of this retailer typically enact during their shopping journey begins with a welcome from a designated store employee before customers begin

browsing the store's product displays. Consumers may seek out information about specific products. They may approach sales associates to learn about product features, compatibility specifications, prices, etc., and can test or interact with products. Once the decision is made, customers proceed to the checkout counter.

The AIDH studied within this thesis was launched in a single signature brick-and-mortar store during its opening within a busy mall in central Auckland. The technology was designed to provide an alternative to a human employee during the welcoming, product information, and exit stages of the shopping script. The AIDH is set up as an avatar in a large in-store kiosk at the store's entrance. A large screen features a youthful female visage of the avatar with question-and-answer capabilities and voice-to-text recognition software. Dressed in the store's staff uniform, the AIDH is a human-like interface that appears to blink, smile, talk and respond in a natural conversational way. As shoppers' approach, the technology senses their presence and greets them like a human employee. Shoppers then stand in front of the avatar, press and hold an activation button, and speak to her through a microphone mounted on a stand directly in front of the interface. The AIDH provides social content (Miao et al., 2022) through interactions with consumers, as opposed to only task-oriented communication and as such, fits into the 'digital human avatar' category of the avatar taxonomy established by Miao et al. (2022). Image 1 provides an example of three similar AIDHs currently operating in the healthcare and telecommunications sectors.

Imagine 1: Examples of AIDHs



To further contextualise this research, it's important to note that New Zealand is a developed Western capitalist economy with all the appropriate uptake of technologies in the business and domestic sectors (Pauleen et al, 2007). New Zealand has a well-developed digital infrastructure in terms of coverage and performance (Kumar & Strazdins 2021), with widespread access to high-speed internet and mobile networks. The use of smartphones, tablets, and computers is common, and social media platforms are widely used (Gibson et al, 2013). Cultural norms related to technology use in New Zealand are influenced by the broader social and cultural values of the country, which shape the way technology is used and perceived. The country's values of sustainability, adaptability, inclusivity, and respect for the environment guide how people interact with and benefit from technology in their daily lives. While New Zealanders are generally open to new technologies, they also approach them with a degree of caution and tend to evaluate the potential benefits and risks prior to adoption, especially in terms of privacy issues (Cullen & Reilly, 2008). New Zealanders typically respond to new technologies with a combination of curiosity, enthusiasm, and a sense of practicality, and often view technology as a means to enhance their lifestyle, well-being and work-life balance (Pauleen et al., 2007).

Observations of consumers interacting with the AIDH in-store were recorded, and in-depth interviews with 13 shoppers were conducted. This provided the core of the data for paper one. This data was then analysed from new perspectives and synthesised through different literature to form the second and third papers. Several supplementary consumer interviews were carried out for paper two (5 additional interviews) and paper three (6 additional interviews) to supplement this original data. While the original interviews provided insight into the ideas discussed in papers two and three, the additional interviews were more targeted towards each paper's specific objectives and concepts.

Multiple data sources were used to create robustness in the data and ensure that the research findings could be presented with confidence. To contextualise the consumer observations and

interviews, several interviews with the retailers' frontline employees, store managers, and customer experience managers were conducted. I also spoke with a representative of the AI design company that created the AIDH to understand the technology from their perspective. During the launch phase of the technology, media releases and online coverage relating to the launch were also collated for content analysis. The combination of these data sources provided the sufficiently detailed and contextualised content needed to construct rich accounts of consumers' experiences with the AIDH.

Before fieldwork commenced, I underwent the Massey University ethics process. This helped me to develop awareness and caution of the ethical issues that could have eventuated from this research process and ensured that the research procedures employed throughout this thesis followed the University's ethical standards. In addition to ethical observances such as consent and maintaining the right for participants to withdraw, other considerations arose from working closely with a case organisation, particularly from collecting data directly from their frontline. Gaining the organisation's trust and commitment to participate was crucial. Consequently, the retailer and their AIDH have remained anonymous throughout the research process to maintain their confidentiality. When interviewing employees, I considered how they might feel wary of the potential consequences of speaking unfavourably and critically about the organisation or the AIDH. In addition to ensuring their privacy, the employee participants were never pushed to provide information if they were uncomfortable doing so. All participants have been allocated pseudonyms for confidentiality purposes which appear alongside the text units throughout the papers.

Given that this thesis intends to explore the social implications of AIDHs on consumers' shopping practices, it was thought that a theoretical lens that conceptualises and isolates the conventions and standards of practices while acknowledging the significance of sociological elements on human experiences would provide an appropriate approach. For this reason, theories of social practice (also referred to as practice theory) were selected as the framework to direct the research

process towards understanding the social significance of AIDHs in retail. The following section introduces this conceptual lens and details an analytical framework derived from practice theory principles that will underpin this research.

1.6 Theoretical Framework: Theories of social practice

Perhaps due to the extensive number of advocates responsible for the origins of theories of social practice (also known as practice theory), including, amongst others, Bourdieu, Foucault, de Certeau, Lyotard, Taylor and Giddens, it is challenging to isolate the commonalities and distinctive features of this theoretical approach (Schatzki, 2011). Emerging within the late 1970s, practice theory circulated the social scholar circles and established itself as a useful theoretical lens for investigating and conceptualising the ever-changing social landscape (Schönian & Laube, 2013). Practices theories offered a new resolution to the fundamental inaccuracies and ‘biases’ plaguing the theoretical landscape at the time (Ortner, 2006). In the extant consumer research literature, this lens represented a departure from an overt preoccupation with the symbolic meanings often attributed to conspicuous consumption and the subsequent implications for consumers’ self-styled identity projects (Gregson & Crewe, 1997). By recognising a synthesis of human agency in terms of an individual’s dispositions and social structures collaborating within a dynamic relationship, practice theories restore the actor to the social process without losing sight, and without giving more than its due, the cultural structures that both constrain and enable social action (Ortner, 2006). Practice theory is predicated on the premise that social practices are the ideal unit for social analysis and stipulates that the source of evolving behaviour lies within the development of the conventions and standards of practices themselves (Warde, 2005).

Despite practices becoming deeply embedded within domestic routines and therefore somewhat resistant to change, they are not so far rooted in habit that they are incapable of alteration

(Jackson et al., 2006). Consumers, for example, are considered knowledgeable, skilful, and reflexive agents (Jackson et al., 2006) who evolve to address their changing needs; however, they are restrained to the boundaries and recognised conventions of the shopping practice. Drawing on practice theories enables an understanding of how actors transition from a position of mastery to beginner levels of competence when faced with a modified context that disrupts their habits of stable practice (Schönian & Laube, 2013). This reflects that of the competent shopper who feels like a beginner when faced with an unfamiliar new technology that has modified their shopping practices.

The dynamics of practice theory can be implemented to study the emergence, stability, and transformation of practices while identifying the relevant elements taking part in this process (Schönian & Laube, 2013). This appears to provide an optimal framework for understanding the consumers' perspective when faced with disruptive changes to their shopping routines, such as those emerging from implementing AIDHs into a retail context. Seeing as such a modification requires consumers to redesign their shopping processes by acquiring new competencies, breaking engrained habits, and establishing new ones; practice theories offer the ability to elucidate the mechanisms involved in reconfiguring the practice of shopping from the inclusion of AIDHs technologies, as this thesis intends to do.

Previous social practice-based consumer studies have concerned themselves with situations in which habitual consumption/shopping practices have developed, transformed, and stabilised (e.g., Bulmer et al., 2018; Miller et al., 1998; Warde, 2005). These mirror a more general and growing interest in a sociological understanding of consumption and marketplace behaviours (see, for example, Elms et al., 2016; Fuentes et al., 2017; Fuentes et al., 2019), that have attempted to capture relevant aspects overlooked by previously dominant approaches to consumption (Warde, 2014). These studies acknowledge how different actors assign diverse meanings to concepts (i.e., efficiency, engaging, enjoyment, confusion etc.) by unpacking the specific meanings associated with

consumption practices instead of viewing concepts as unidimensional. Such studies elaborate on the dynamic and sophisticated nature of consumers' shopping performances to more precisely understand the social significance and multiple meanings associated with consumption.

Jackson and Holbrook's (1995) study of two north London shopping centres provides an early example. While attempting to understand the potential meanings of shopping, the authors uncovered five distinct characteristics. These include shopping as a source of pleasure and anxiety; shopping as a socially situated activity; consumers as knowing, active subjects; and shopping as a highly and complexly gendered activity. Similarly, Miller et al. (1998) revealed that shopping is as much an investment into social relationships as it is a means to acquire necessary commodities. Despite families rarely completing the shopping process as a unit, results suggested that family-related social relations are the central context of contemporary consumption. Building upon these studies, Jackson et al. (2006) demonstrated the extent to which shopping is socially embedded within specific routines and dynamics of domestic households, further illustrating the interesting and unique theoretical findings that a practice-based consumer study can offer.

As innovations tend to radically modify human behavioural patterns, it is perhaps unsurprising that practices have been the discussion point of several studies involving innovations within a shopping context. For instance, Fuentes and Svingstedt (2017) illustrated how mobile phones reconfigure the practice of shopping by transforming the agency of consumers. In the paper developed from my honour's thesis, Bulmer et al. (2018) implemented a practice theory lens to explore the impact of self-service checkouts in forcing adaptations to shopping practices. We unravelled social dimensions that determine experiences with the technology, such as a sense of social obligation felt by unwilling consumers to use them to benefit others. This paper illustrated the analytical effectiveness of social practice theories in developing a broader appreciation of consumer engagement with new retail technologies and the social implications that can result. This thesis

intends to build from this by demonstrating the explanatory power of this theoretical lens in the context of AIDHs within a retail context.

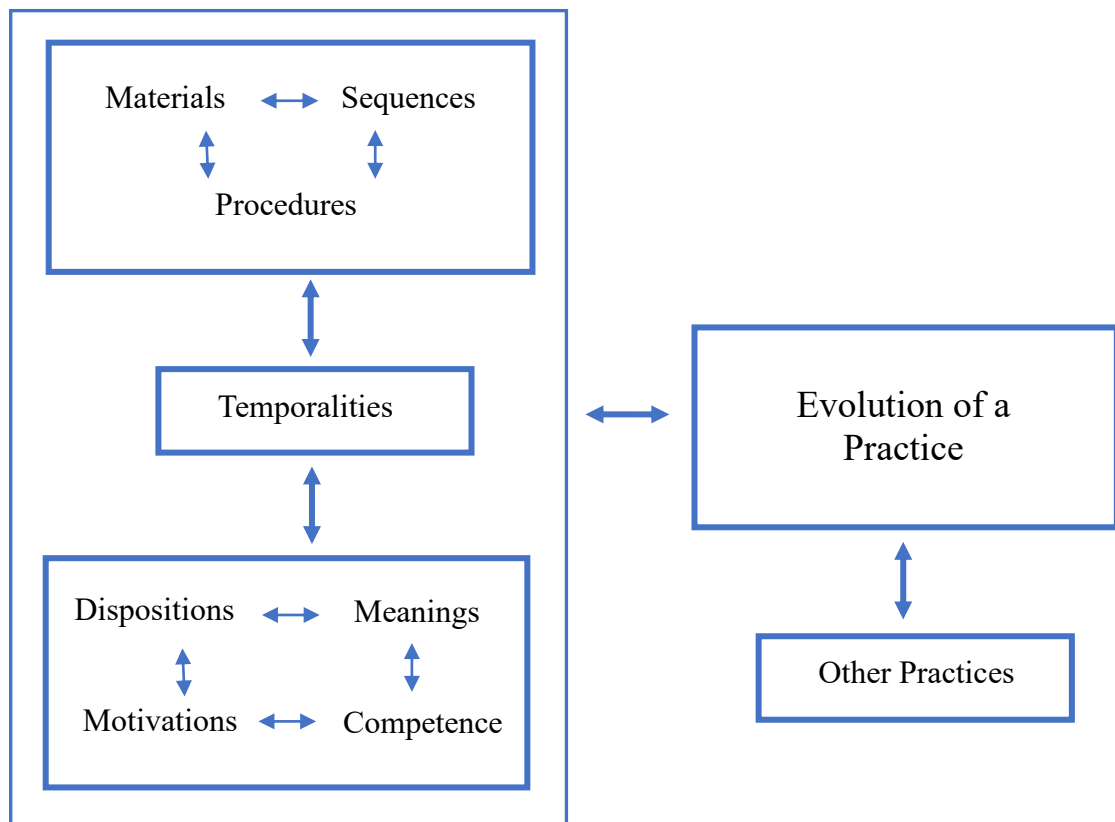
1.6.1 Practice theory analytical framework

There have been several recommendations on how to transform practice theory into an analytical framework to mobilise the concepts of practice theory in the production of academic research. For instance, Southerton (2013) suggests that to comprehend how practices evolve; one must first understand how certain dispositions (a consumer's attitudes, tendencies, and propensity to act in a particular manner when exposed to an AIDH, for example), sequences (the steps involved in using an AIDH), and procedures (the rules that govern the sequences) combine and transform over time. Additionally, how these dispositions, procedures and sequences become intertwined within specific temporalities (interactions with other consumers and staff, as well as the overall retail environment at any given moment, for example) must be understood. Shove, Pantza and Watson (2012) also suggested that the creation or transformation of practices can be best interpreted by understanding the connections between the associated meanings, assemblages, interconnecting materials (e.g., such as technologies, including AIDHs), as well as the degree of competence held by participating consumers (the level of skill shoppers possess when interacting with AI technologies) (Strengers et al., 2016).

A practice (i.e., the practice of shopping) is therefore made up of sequences, procedures, and materials, and as these evolve, so too does the practice, and so must the actor. One actor's experience within a practice may differ from another, which varying dispositions, motivations and levels of competence can explain. According to the key practice theorists mentioned above, understanding the relationship between these elements is necessary for researchers to accurately acquire insights into the formation or development of a practice. Combining these ideas can conceptualise a social practice

analytical framework (see Figure two). The use of this conceptual lens within this thesis provides an important distinction between my work and prior research on retail AI technologies.

Figure 2: Social Practice Analytical Framework



1.7 Thesis Structure

This chapter has introduced a study that unravels the social dimensions that influence consumers’ experiences with retail AIDHs as well as the social implications of the technology. The purpose, methodology and theoretical framework of this thesis have been detailed, and so too has a justification of the necessity and significance of the topic from both a theoretical and practical perspective. The remainder of this thesis is structured into four additional chapters. The following three chapters comprise three distinct research papers, each of which will address one of the three objectives of this thesis.

Chapter Two: The social significance of AI in retail on customer experience and shopping practices

2.0 Abstract

This paper draws on practice-informed, ethnographic research to develop an understanding of the novel social consequences and opportunities afforded from consumers' interactions with AIDHs as part of the in-store shopping experience. We reveal and interrogate consumers' experiences with AIDHs in an exploratory qualitative study undertaken during the launch phase of an in-store kiosk like a digital store greeter in a flagship store of an industry-leading national technology and appliance chain. The findings contribute to understanding the social significance of AI in retail on customer experience (CX), and the managerial implications of consumers' interactions with AIDHs are described and discussed.

Keywords

AI, Digital humans, Shopping, Service encounters, Customer Experience, Social Practice

2.1 Introduction

As retailers pursue more creative and profitable uses of their physical shopping spaces, consumer-facing Artificial Intelligence (AI) digital humans continue to be incorporated into frontline retail environments, rapidly reshaping the nature of service encounters (Reis et al., 2020). In particular, the recent emergence of AI conversational interfaces, such as, for example, Singtel's Stella AI automated customer service agent in 5G retail stores, has attracted the highest share of worldwide AI-related investment USD4.5 billion in 2019 (IDC, 2019) and is further fuelling the digitalisation of the retail environment. As a result, traditional modes of service delivery – service by employees – are

being substituted by some retailers in favour of delivery through technology (Huang & Rust, 2018), as they can offer substantial benefits to businesses, including increased efficiency and lower labour costs. Alternatively, as in the current research, other retailers are using AI interfaces to enhance the in-store shopping environment by supplementing the efforts of frontline employees by delivering higher personal services and differentiating their stores compared to their competitors (Larson, 2019).

While retailers have the potential to access these AI interfaces, there is little certainty as to how they can be effectively incorporated into their existing strategies and, arguably more importantly, how their consumers will react to them (Inman & Nikolova, 2017). Retail encounters between human consumers and AI interface employees are increasing, but how and to what extent such technologies impact consumers' in-store experiences and their associated shopping practices raises concerns for the future of customer experience (CX) in retailing. This, therefore, provides the focus of the current research.

Specifically, this paper explores consumers' interactions with AIDHs as part of the in-store shopping experience, which, to date, remains underplayed in the extant literature, therefore, warranting further attention. This partly results from the limited range of methodological approaches adopted in existing literature, which tends to privilege consumers' perceptions of AI rather than their actual behaviour (Verhulst et al., 2020). This has led to calls for alternative methodologies to capture and investigate the complexities and dynamics of CX (Kuppelwieser & Klaus, 2021).

Accordingly, in this paper we draw on practice-informed, ethnographic research to develop an understanding of the novel social consequences and opportunities afforded from consumers' interactions with AIDHs as part of the in-store shopping experience. In doing so, we reveal and interrogate how consumers' experiences with AIDHs are implicated in their existing store-based shopping practices. To this end, the findings contribute to an in situ understanding of the manifold

social significance of AI in retail on CX and extend the growing sociological-informed debates focusing on shopping and marketplace behaviours (Elms et al., 2016).

In terms of structure, we begin with a literature review that considers the implications of AIDHs on consumers' in-store experiences and the broader social significance of AI in retail on consumers' shopping practices. Following a brief discussion of the methodology and case description, we report on an ethnographic study focusing on consumers' experiences and in-situ interactions with an AIDH in a leading technology and appliance store in Australasia. We then discuss the study's core findings and outline the resulting managerial implications of this research regarding the future of AI in retail on CX. We conclude with suggestions for further research.

2.2 Theoretical background

2.2.1 CX of in-store AI Retail Technologies

Customer experience – the “non-deliberate, spontaneous responses and reactions to offering-related stimuli along the customer journey” (Becker & Jaakkola, 2020, p.637) - has received significant attention in the marketing and retail literature in recent years. However, the topic remains in its infancy, with further scope for conceptual development and empirical research. More specifically, there have been calls for a more holistic understanding of CX as part of the overall customer journey (e.g. De Keyser, Verleye, Lemon, Keiningham, & Klaus, 2020) to address the complexities of the topic in an ever-changing retail landscape (Homburg et al., 2017; Lemon & Verhoef, 2016). In addition, customer-facing in-store technologies, such as AI, Virtual Reality, and Augmented Reality, create novel opportunities and challenges for customers and retailers. Indeed, retailers require insights into how they can strategically use such technologies to maximise CX and performance.

The extant literature has underscored that as the physical and digital dimensions of retailing begin to merge, shopper-facing intelligent objects, which increasingly possess the ability to sense and communicate, are beginning to dramatically alter the ways in which consumers are experiencing the service of retailers (Huang & Rust, 2018). Such technologies are accelerating the rate at which the retail landscape is evolving (Grewal et al., 2017) and are revolutionising interactions between consumers and businesses (Lee & Yang, 2013). Several issues have emerged in the literature surrounding how this paradigm shift may impact consumers' experiences within retail environments. For example, the buying process has become progressively dehumanised (Evans, 2004) as in-store technologies begin to replace human interaction (Lee, 2017). Moreover, the frequency of such technology-mediated interactions has also increased due to the emergence of numerous technological systems within the traditional brick-and-mortar shopping context (Bulmer et al., 2018).

Consequently, the World Economic Forum has described AI as the central point of the globe's current technological revolution as it, along with a raft of complementary new technologies, has laid the foundations for radical business advances that augment consumers' shopping experiences and streamline the delivery of service, while promoting the creation of novel business models (Reis et al., 2020). Simply put, AI refers to a machine, algorithm, system, or network capable of exhibiting characteristics of human behaviour or intelligence (Huang & Rust, 2018). AI, in the form of a service delivery system, has been borne out of the amalgamation of several contemporary technologies (neural networks, machine learning, natural language processing, sensors, etc.) and has now reached a point where the same productivity development experienced in consumer goods through the industrial revolution is now occurring with services in the industrialisation of services (Wirtz et al., 2021).

AI, particularly digital human conversational interfaces, are increasingly being adopted in brick-and-mortar retail environments (Kaplan & Haenlein, 2019) and can autonomously interpret

external data from various service scenarios and use those learnings to achieve specific tasks and goals, such as improved consumer experiences. Such human-like digital avatars, with the ability to converse with customers in-store while guiding them through their shopping journeys, are now being used by retailers to reduce employment costs, increase the speed of delivery, provide a point of differentiation, improve the management of service demand fluctuations, and to improve customer shopping experiences (Grewal et al., 2017). This technological catalyst has sparked a service revolution (Rust & Huang, 2014), with service encounters transforming from what was previously considered a ‘game of humans’ (Bowen, 2016) to a practice that is now increasingly autonomous and technology-dominant (Larivière et al., 2017). Consequently, how service is provided and experienced by its two primary actors – customers and service employees – has fundamentally changed (Bolton et al., 2018) and warrants further attention.

Similarly, although innovations in service delivery due to new technologies are understood to offer the potential to generate change in consumers’ experiences in-store (Ram & Sheth, 1989), little is known about how and to what extent AIDHs are implicated by the social context in which shopping occurs. Indeed, the use of rapidly advancing AI interfaces that can learn, process, affect, and mimic human characteristics in retail encounters has received limited attention in the extant literature, with a noticeable paucity of research that considers retail encounters in which the exchange is characterised by a digital human actor playing the role of the frontline employee (Robinson et al., 2020). Despite attempts to address this issue, extant research has primarily adopted a psychological perspective (see, for example, Huang & Rust, 2018; Jeong & Ha, 2020), with far less being understood about the social opportunities and possibilities for consumers when interacting with retail AIDHs as part of the in-store shopping experience. Therefore, this lends itself to considering the nature of consumers’ actual shopping practices, which forms the discussion below.

2.2.2 Social Practice Implications of AI in Retail

Theories of practice have been mobilised by other researchers investigating in-store shopping (Bulmer et al., 2018; Jackson et al., 2006; Warde, 2015) and mirrors a more general and growing interest into sociological understandings of consumption and marketplace behaviours, as discussed elsewhere (see, for example, Elms et al., 2016; Fuentes et al., 2017; Fuentes et al., 2019). From a practice perspective, the social organisation of the mundane and the routine nature of everyday consumption is emphasised (Randles & Warde, 2006), as are concepts such as routine, habit, and constraint (Warde, 2005). This, therefore, signals a departure from an overt preoccupation with the symbolic meanings often attributed to conspicuous consumption and resulting implications for consumers' self-styled identity projects in the extant consumer research literature (Gregson & Crewe, 1997).

In addition, theories of practice can also provide a way of understanding how behaviour evolves, how new participants are recruited to a particular "community of practice" (Wenger, 1998) to enable the ongoing continuation and transformation of practice, and how particular practices become combined and integrated within a nexus of other related practices (McMeekin & Southerton, 2012; Shove et al., 2012). Such entails consideration of specific moments of practice and the particular assemblages interconnecting materials (such as technologies, including the AIDHs), meanings, and the degree of competence held by participating individuals (Strengers et al., 2016).

Introducing an AI actor into a physical retail store lends itself to modifying the settings and environments where consumers shop, allowing consumers to reconfigure how they approach and use retail spaces (Fuentes et al., 2017). This, in turn, affords the possibility of new meanings, dispositions, procedures, and sequences that shape CX (Southerton, 2013). In such situations, the traditional human-to-human service encounter requires consumers to interact with unfamiliar materials and technologies, which necessitates the formation of new knowledge, skills, and competencies. It also

simultaneously requires consumers to transition from the familiarity of shopping mastery to an unaccustomed ‘amateur level’ shopper. Therefore, the emergence of AI conversational interfaces, such as AIDHs, transforms the shopping context and disrupts consumers’ deeply embedded shopping practices. Nevertheless, as consumers can best be understood as knowledgeable, skilful, and reflexive agents (Jackson et al., 2006), practices are not so embedded that they are exempt from change. Instead, they evolve to fulfil consumers’ everyday needs and requirements.

The above discussion has four main and overlapping research questions. RQ1: Which specific contexts and situations give rise to or are barriers to consumer interactions with AIDHs in-store? RQ2: Which socio-material and technical assemblages lend themselves to successful and unsuccessful consumer interactions and experiences with AIDHs in a physical retail setting? RQ3: How, and to what extent, do such technologies become integrated within consumers’ shopping and related practices? RQ4: What are the social meanings and relations that emerge from consumers’ interactions with AIDHs as part of the in-store experience? In addressing these questions, the current research seeks to reveal and untangle the social possibilities, opportunities, tensions, and consequences that result from consumers engaging – or disengaging – with AIDHs in-store.

2.3 Methodology

Discovery-oriented research goals influenced the selection of a multi-phase ethnographic approach to exploring consumer interactions with an AIDH interface as part of the in-store experience in a single setting. Permission was gained from an industry-leading national technology and appliance store chain in Australasia to study their new digital frontline employee. This case was selected primarily on its inherent characteristics (Koivu & Hinze, 2017) and relevance to the research topic (i.e., the existence of an AIDH within the retail environment). Given the size and status of the retailer and that their AIDH was the first of its kind within the country, this case was considered by the

authors to be substantively significant (Beach & Pedersen, 2019) and would provide suitable learning opportunities for other retailers that wanted to implement similar technology. The AIDH was launched in a single signature store during its opening, and ‘her’ introduction was intended as a complement rather than a replacement for front-line human service employees to enhance its overall service offer.

A series of activities were conducted to collect data for this study in two stages. First, to contextualise the study, several interviews were conducted with store staff and managers, the developer and head office leads in areas including CX and operations. These were audio recorded and transcribed. Second, customer observation diaries were kept during the launch phase of the in-store technology, along with intercept interviews with shoppers. The observations were conducted at intervals across a 12-month period, with observation diaries that focused on how the consumers were reacting and interacting with the digital human being generated in-store. The lead researcher stood outside the store, looking back into the store, and observed shoppers as they noticed the AIDH and interacted with it. The intercept interviews (Bush et al., 1991) were conducted when consumers had just finished using the digital human when leaving or entering the store. These informal chats lasted around 5 minutes and were very flexible regarding what was discussed. The main purpose of these was to capture the user’s thoughts about the AIDH while the interaction was still fresh in their mind. During the launch phase, media releases and online coverage relating to the launch of the AI interface were also collated for later content analysis. The use of multiple data sources and multiple researchers during the analysis phase enhanced the trustworthiness, credibility and richness of the analysis process and subsequent findings.

Semi-structured interviews with 13 shoppers were transcribed. Shoppers were recruited in-store; their ages ranged from 22 to 65, reflecting the retailer’s core demographic. Using a purposeful sampling approach, our focus was on the consumers who were interacting with this new and unique technology in-store, noting that this technology was unfamiliar to consumers as it was new to the

industry. A summary of the 13 research participant’s profiles highlighting gender, age and some occupation and family situation follows in Table 1. The participants have been allocated pseudonyms. Where text units are provided in this paper, the participants are identified by their pseudonyms.

Table 1: Pseudonyms and profile of interview participants (Paper 1)

Pseudonyms	Participant Profile
Kurt	Male, late 50s, stepfather of three, often visits the store with his grandchildren
Poorvi	Female, mid 20s, beauty therapist, has used the AIDH multiple times
Serena	Female, early 30s, master’s student, first-time using the AIDH
Jayce	Male, late 30s, high level of technological proficiency
Abhi	Male, early 30s, business analyst
Huckleberry	Male, late 30s, lecturer, single, high-level of technological proficiency
Sahil	Male, late 20s, was shopping alone when approached by the researcher
Jimmy	Male, early 40s, newly married, first-time using the AIDH
Mia	Female, late 20s, digital marketing manager, loyal customer of the retailer
Margaret	Female, late 50s, secondary school teacher, mother of three
Harry	Male, late 40s, media director, newly married, first-time using the AIDH
Mark	Male, early 60s, was shopping with his wife when approached by the researcher
Luke	Male, early 20s, builder, mostly purchases gaming products from the retailer

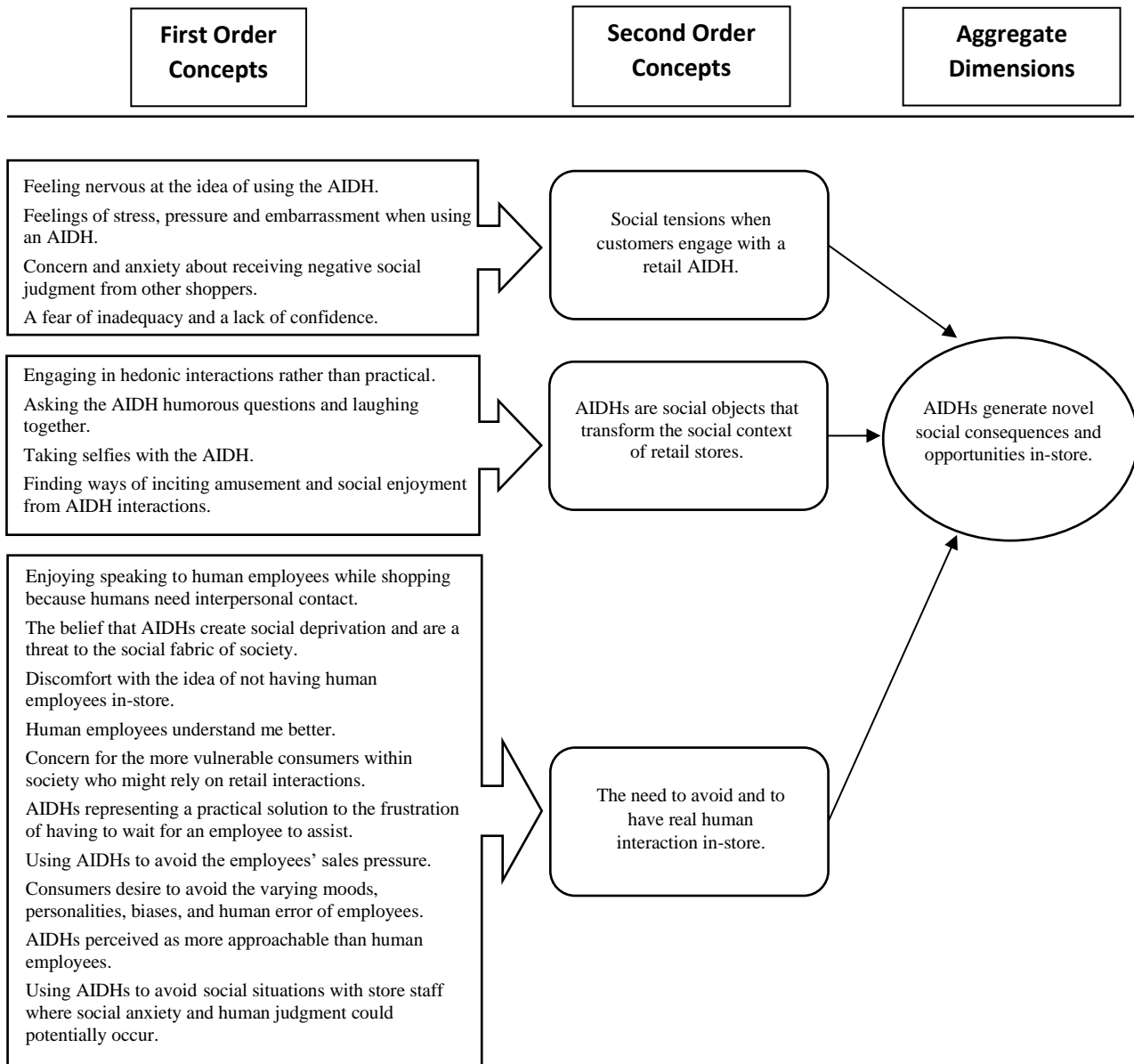
2.3.1 Data analysis

Data analysis involved an iterative process of interpreting and making sense of the data by identifying themes or patterns that address the research questions. The data was analysed concurrently with data collection using an iterative approach involving constant reiteration between data collection and analysis to take full advantage of the flexibility that the case research method affords (Eisenhardt, 1989). Aligned with the abductive reasoning approach (Glaser, 1978; Spiggle, 1994), our understanding of consumer practices with the AIDH ‘emerged’ from the data in the absence of any preconceived theories or hypotheses. The researchers adopted grounded theory techniques when carrying out the analysis (Glaser, 1978) to identify several themes grounded in the lived experiences of the participants that progressively contributed towards a more abstract understanding of the research topic.

The initial stage of the analysis involved multiple readings of the transcripts by each of the three authors of this paper to develop a rich understanding of the data from different perspectives. At this stage, we identified and collected relevant data extracts that served as the basis of our analysis. (Corbin and Strauss, 2008, Glaser, 1965). Our primary interest was how consumers' experiences with AIDHs are implicated in their existing store-based shopping practices.

Subsequently, we followed the three-level coding model elaborated by Gioia et al. (2013), which involved the data being organised into a data structure. This was developed by the lead author using a process of open coding (to derive first-order concepts from our data) where textual extracts related to similar issues were grouped together. These first-order codes were then grouped into second-order themes using axial coding by relating the codes and categories identified through the open coding phase to identify relationships within the concepts and themes (Spiggle, 1994; Strauss & Corbin, 1990). A sample data coding structure is provided in Figure 3. The themes that arose from the analysis were selected primarily on their connection to research objectives. The researchers do not claim that every possible angle that could have emerged from the data has been exhausted. Data was excluded if it did not shed light on the social dimensions of AIDHs in retail. The authors referred to the relevant literature consulted throughout the formation of these themes to ensure that they had theoretical relevance. Discussions between all three authors considered rival interpretations of the core themes before final interpretations were agreed upon.

Figure 3: Sample data coding structure



2.4 Case Description

The AI digital assistant was set up as an in-store kiosk, like a digital store greeter or concierge, at the entrance to the store. For the purposes of this paper, we are calling the AIDH by a pseudonym, Paula. A large screen features a youthful female visage of Paula with question-and-answer capabilities and voice-to-text recognition software. Paula, dressed in the store's staff uniform, is a human-like interface that appears to blink, smile, talk and respond in a natural conversational way.

As shoppers approach, Paula senses their presence and greets them similar to that of a human employee. Shoppers then stand in front of Paula, press and hold an activation button, and speak to her through a microphone mounted on a stand directly in front of the interface. The system is supported by a database of queries and answers designed to be updated as her training and learning progress. A key outcome of the initiative was to connect customers with store staff members, which included providing the staff member with details of the conversation, such as what products they required.

2.5 Findings

Thematic analysis of the dataset revealed three key themes; social tensions are introduced when customers engage with an AIDH; this new technology can transform the in-store social situation and become the ‘life of the party’; when a non-human interface is introduced, there is paradoxically both the need to avoid and to have real human interaction. These themes build a picture of the various social possibilities of AI in retail on CX, and evidence of the three themes is discussed in the following sections.

2.5.1 Social Tensions

Many interviewees described Paula as the type of technology that will change their shopping practices over time. These customers see Paula as something that will ultimately provide shoppers with additional agency and simplify their shopping experiences by reducing the duration of their shopping journey and allowing for a more efficient and informed shopping journey due to the provision of additional information. While the eventual outcome appears attractive, several participants expressed reservations about disrupting their established shopping practices as they

attempt to integrate Paula into their shopping routine and transition into a new community of practice. The use of an AIDH created anxieties and tensions that are not associated with typical consumer-to-employee interactions. Several consumers who participated in our study described feelings of stress, pressure, and nervousness as a consequence of sensing that they were on the receiving end of negative social judgment (mainly from other shoppers and store staff) caused by their incorrect use of Paula. These participants felt as if unwanted attention is drawn to anyone who does not use Paula correctly and that a normally private encounter with a staff member may turn into a public one with Paula.

Speaking to Paula and then waiting in awkward silence as she just stares at you can be embarrassing when people are watching. Or when Paula replies in a loud voice that she is unable to understand is a little embarrassing (Abhi)

There is only one Paula, so when I go and approach her, I have a few people watching me, which makes me a little bit more self-conscious and anxious... When things go wrong, using Paula can turn a private discussion into a very unpleasant public experience (Poorvi)

Fear of inadequacy while engaging with Paula was the cause of negative consumer interactions with her. Insecurities that arise due to appearing incompetent while using consumer-facing technology have been described in the literature previously (Bulmer et al., 2018; Elms & Tinson, 2012) and appear to be a driving factor in consumers' experiences with AIDH in-store. Several participants felt uncomfortable and vulnerable as they transitioned from perceiving themselves as a customer who could complete a shopping journey autonomously and competently to a shopper who required a human employee's help to operate effectively within a retail environment. This feeling of apparent incompetence was exacerbated when Paula suggested that a human employee should be called over to assist. While some consumers interpreted this response as a result of Paula's inability to "do her job", many customers inferred that this was a fault of their own poor technological

or communication skills, negatively impacting their sense of self-worth and social identity as competent shoppers.

While studying the paradoxical effects of technology on consumer behaviour, Mick and Fournier (1998) noted that although new technologies can facilitate feelings of intelligence or efficacy, so too they can lead to feelings of ignorance or ineptitude. Such an idea was revealed throughout our intercept interviews with customers who appeared to express curiosity about Paula while actively avoiding engagement with her. After rejecting an offer by the interviewer to come and interact with her, the fear of appearing incompetent was discussed as a critical reason why these predominantly older customers would prefer not to interact with Paula at all. Moreover, those who had tried using Paula before abandoning the interaction reported a negative shopping experience due to a lack of confidence in their ability to use her correctly. This theme was also evidenced by aggressive complaints about the lack of instruction regarding how to operate Paula successfully. Such complaints, and the tone in which they were communicated, highlighted a deep frustration with being in a situation where shoppers were made to feel incompetent within a social setting.

The idea that *“people like what they are good at”* has been described in the broader consumption literature. An example of this was reported by Murphy and Patterson (2011) when they found that competence plays a central role in the consumption experience of motorcycling. As our study suggests, the extent to which consumers feel competent while interacting with in-store AIDHs appears to mediate consumers’ overall shopping experience. Our findings further exemplify the social tension when AIDHs are deployed, and customers attempt to reconfigure their established shopping practices. It also contributes to a more nuanced account of the internal tensions that plague consumers as demands to evolve are put on their deeply habitual shopping practices in a changing retail environment.

2.5.2 *The Life of the Party*

Shopper observations revealed an unexpected type of consumer usage and benefit in which the AIDH has essentially established herself as the “*life of the party*”. Paula’s presence created a tendency to transform the social situation in which customers shop, and this transformation appears to have profound behavioural and emotional implications for consumers’ shopping experiences. Rather than acting merely as a tool that consumers utilise to guide them through their shopping journey, Paula added life to the social environment of the store by providing a social resource that could enable social opportunities that otherwise would not have existed. This idea became evident when comparing shoppers’ interactions across various social situations (shopping alone versus shopping with friends/partners/family).

On multiple occasions, the observer witnessed consumers, accompanied by friends or family, present Paula with humorous questions. These were apparent attempts to test her conversational competence to elicit a laugh from their shopping companions. Questions such as “*Paula, do you have a boyfriend?*”, “*Paula, what did you have for lunch?*”, “*Paula, do you like my outfit?*” or even “*Paula, would you like to go on a date with me?*” were all asked by various shoppers we observed. Paula was even confronted with philosophical questions such as “*Paula, do you believe in God?*” to generate shared laughter and strengthen social bonds with their companions.

Whether this behaviour was acted out by fathers attempting to entertain their children, friends attempting to demonstrate their wit, or husbands attempting to impress their partners, the outcome was the same; Paula enhanced the in-store social environment and facilitated a more rewarding consumer shopping experience. While consumers shopping alone tended to use Paula for more practical purposes, such as seeking guidance through their shopping journey, many customers shopping in groups saw Paula as an opportunity to entertain their “*audience*”. Research by Nasermodeli et al. (2013) and Verhoef et al. (2009) found that retail environments that foster strong

consumer-to-consumer social connections will likely result in more positive customer shopping experiences. Our observations and interviews with Paula users found that by enabling shoppers to engage in shared entertainment through hedonic interaction with Paula, more enjoyable consumer experiences were attained.

If I go in [to the store] and I've got the grandkids with me, my grandkids love it because they like pushing the buttons and asking Paula questions like 'Did you do well at school' and that kind of thing, and it's really good for me because sometimes I need to fill the kids time – it's like free entertainment for me (Kurt)

It would be like a fun thing, you know, for young people. Like a group of teenagers who are going to the mall together and just having fun together trying that [Paula] out and doing some monkey business with Paula and all that stuff (Huckleberry)

Paula's ability to enhance the social environment is driven by factors beyond providing consumers an opportunity to engage in playful and friendly conversational exchanges. Many consumers, particularly younger generations, accepted Paula's invitation to take a selfie with her. According to Berger and Barasch (2018), group photos convey one's desired identity to an intended social group, which has become a ubiquitous mode of social communication (Schlenker, 1980). By engaging in a group selfie with an AIDH posing eccentrically in the background, consumers can obtain an unexpected social souvenir and enjoy the subsequent social outcomes. Additionally, Diehl et al. (2016) found that photo-taking causes people to become more engaged in activities and illustrated this enjoyment of positive experiences across various contexts. By taking a selfie with Paula, not only are various social benefits realised by shoppers, but an improved consumer shopping experience is enjoyed.

Although this outcome of AIDH interaction did not assist consumers with their shopping journey in a practical sense, it improved the social environment of the store, increasing the hedonic

value of the shopping process and enhancing the shopping experience. Such an observation builds upon previous studies that discuss the link between the social environment of retail spaces and consumers' shopping experiences. Researchers have discussed the implications of having multiple humans (consumers and employees) in a retail store environment simultaneously and how the behaviour/experience of each human can impact that of others (Andajani et al., 2014; Nasermoadeli et al., 2013; Peter & Olson, 2008; Verhoef et al., 2009). Researchers have also observed that consumers frequently visit retail spaces with friends or family and that this collaborative shopping approach influences the shopping experiences of all those involved. While the more traditional forms of in-store social interactions have been explored (consumer to employee, company to employee, company to consumer, and consumer to consumer), the observation that Paula acts as a social object capable of transforming the social environment that consumer shop within further illuminates the sociality of shopping while providing further contribution regarding the influence of AIDHs on the in-store consumer shopping experience.

2.5.3 Avoiding Interaction with Employees versus Need for Human Interaction Paradox

While talking to customers about the meanings they assign to their experiences with Paula, it became clear that the way consumers evaluate their perceptions of Paula is somewhat paradoxical. When discussing the influence that AIDHs have on the availability of interpersonal interaction within physical retail environments, contradictory views and attitudes were presented. The complexity of modern society and the human condition has been characterised by paradox (Brown, 1995; Firat & Venkatesh, 1995; Handy, 1995). Mick and Fournier (1998) famously took this idea and applied it to modern technological products, concluding that the meanings consumers assign to their technological experiences are also paradoxical. Consumers' attitudes towards AIDHs, as indicated by our dataset, appear to be no exception insofar as one of the key reasons why Paula is strongly liked is the same

reason why she is strongly disliked. When asked about their motivations to engage with or avoid Paula in-store, different interviewees put forward opposite rationalisations. AIDHs grant consumers the option to avoid interaction with human employees in-store while at the same time depriving consumers of their need for human interaction. Our dataset revealed that while some consumers seek Paula to avoid human interaction with store personnel, other consumers avoid Paula due to their need to interact with human employees.

2.5.3.1 Need for in-store human interaction

Some academics have posited social deprivation as the principal reason an impersonal service environment might harm consumers' shopping experience (Dabholkar & Bagozzi, 2002). In the case of in-store AI interfaces specifically, Huang and Rust (2018) have emphasised the possibility that consumers will still prefer to know that humans are serving them, even though the service may be technically inferior. Moreover, many researchers have argued that the true core of service lies in the nature of interactions between service employees and consumers (Bowers & Martin, 2007; Guenzi & Pelloni, 2004; Sweeney et al., 1997) and that well-trained retail personnel play a critical role in forming positive consumer experiences through their expertise, skill, attitude, body language, and behaviour (Jain & Bagdare, 2009). According to psychology and communication literature, humans are naturally eager to connect with others, and this need is a fundamental social motive that explains a significant proportion of human behaviour (Baumeister & Leary, 1995). It is perhaps not surprising then that a lack of “*real*” human interaction arose as a primary theme throughout our shopper interviews. Several participants expressed dissatisfaction with the perceived reduction in human interaction resulting from implementing an AIDH.

I really don't understand why companies think that people actually want to talk to machines, I don't want to speak with them at all...The first time I used Paula it was ok, but she didn't

answer my questions sometimes so I felt a bit silly standing there talking to this thing [Paula], and I wasn't getting the answer I wanted (Kurt)

It's always nice to speak to somebody when you're doing your shopping (Margaret)

If I have a question in a store, I prefer to talk to a human... There is a lot of stuff that Paula doesn't know [like warranties] that I need to speak to a person about. I'm never to going buy straight off Paula... My wife doesn't like Paula at all... she would much rather walk around for ages trying to find somebody... She [Paula] needs to understand exactly what I'm saying too, like when you talk to a person, they understand your body language and understand what you want, but with Paula, you have to express yourself perfectly and I don't have to sit to sit there asking her one hundred questions. It's supposed to be more helpful than that (Kurt)

Having an interaction with a person is much nicer than having an interaction with a machine with a stupid voice. When I go into the community, I like to have some relationships with people [who live in my area] (Abhi)

This concern about real human interaction has been alluded to by researchers since the earliest implementations of end-user information systems in retail environments. Videotex technology, for instance, was released in the late 1970s and delivered information to consumers in a computer-like format. However, according to Ram and Sheth (1989), it was met with consumer resistance when it forced changes to shopping practices because consumers could no longer interact with store personnel directly. In the case of AIDHs, the scope for social deprivation due to a reduction in human interaction is considerably more concerning than for the self-service technologies that came before it, according to our dataset, and the extent that customers fault AIDHs for a reduction (and continued reduction) in human interaction is far greater.

Our interview processes also alluded to confusion with the idea of Paula pretending to be something that she is not. Specifically, a non-human entity (Paula) attempting to replicate genuine human interaction caused discomfort for some of our participants seeking human connection.

It was kind of a little bit weird that there was a digital human being that tried to be human but it is not human, you know?... Just having this animated picture on the screen is not a real human to me, but it was creepy that it tried to be human with its gestures and facial expressions and stuff like that, especially when she tried to smile, it was creepy for me. So I felt a bit of weirdness and uncomfortableness...Trying to communicate human emotions visually with facial expressions I think the technology is not there yet... A little bit creeped out, because of this kind of artificial human but not human... When talking to like a checkout operator, there is a bit of empathy or interest in the person when talking to them or asking them about their weekend. What's the point in asking an AI how was their weekend? I think there is no real reason to have those chit-chats with an AI because there is no weekend for the AI, there is no life for the AI that they could talk about (Huckleberry)

Some of our participants see Paula not merely as an obstacle to human interaction but more as a threat to the social fabric of society. For these shoppers, concern extended beyond the annoyance of talking with a machine instead of a human.

I think there is a point in our future where we might have to transition into a phase where there is less human interaction, but there are certain interactions with machines that we actually don't need and we need the human touch...Some things need the human interaction... I am concerned about this transition, it is going overboard (Poorvi)

Artificial humans create artificial interactions. Not really something we [our society] need right now... Kind of the beginning of the end for human connection (Kurt)

Participants with this perception have echoed the idea that humans need human interaction, an idea defined by Dabholkar (1996) in the consumer behaviour context as a consumer's tendency to desire and highly prioritise the emotional-social outcomes of personal interaction during service encounters. Several researchers have identified that the need for interpersonal contact goes hand in hand with a need to avoid machines (Prendergast & Marr, 1994). In other words, a need for interaction deters some consumers from using in-store technologies (Dabholkar & Bagozzi, 2002; Lee & Yang, 2013), and based on our observations, can significantly and negatively affect their experiences with AIDHs and evaluations of service encounters.

Implications of social deprivation from the continued replacement of human interaction with retail technologies have also been discussed by researchers at the societal level (Čaić et al., 2018; Sparrow & Sparrow, 2006). Consumers, consciously or subconsciously, tend to partake in the shopping process not merely to buy what they require but also to seek social interaction (Lee & Yang, 2013). With the perceived natural outcome of the eventual widespread rollout of AIDHs being a lack of human interaction, a few participants also expressed concern for the more vulnerable consumers within society who might rely on retail interactions as one of the primary sources of human connection.

I just think that it's a bit sad to see us heading in this direction. I mean, it doesn't really affect me, but I would imagine there are people that quite enjoy talking to people when they shop
(Margaret)

Such concern, whether based on one's preference to interact with store personnel or apprehension for other consumers who might be using retail stores to fulfil their social needs, appears to limit some consumers' ability to embrace Paula fully. These concerns negatively affect their experience with her.

2.5.3.2 Need to avoid in-store human interaction

In contrast to those concerned about the lack of human contact, some participants expressed the opposite. Circumventing the necessity of interacting with human employees has been a factor expressed by those interviewees who were most impressed with Paula, and indeed, avoiding unwanted interaction with service employees has been discussed in the literature as a primary factor that enhances the shopping experience for specific consumers as a result of the introduction of in-store technologies (Dabholkar, 1996). Elms, DeKervenoael, and Hallsworth's (2016) study of internet grocery shopping behaviour identified a similar theme when they found that some shoppers seek out self-service checkouts to avoid interaction with store personnel. Many of the consumers we approached during our intercept interviews described their frustrations with waiting for an employee to assist them within retail stores and were delighted to see a practical solution. Another rationalisation for this viewpoint is that consumers can bypass the human employee's sales pitch by avoiding interaction with store employees and therefore avoid the uncomfortable pressure to purchase. Likewise, consumers can avoid adverse outcomes of the varying moods, personalities, and biases (e.g., cultural, gender, age, and social standing) of those service employees and eliminate human error when interacting with an AIDH.

I personally love using them. I don't have to deal with people ...I personally don't actually enjoy having to talk with strangers when I shop, so I like this [Paula] (Luke)

A good thing about Paula is that there is no sales pressure on there...when you speak to a person [human employee] and they go through the whole drama [sales pitch], you feel almost pressured to buy it (Kurt)

For me I'm from a culture where you are not talking a lot to staff, only if there is information that I need, and I'm more a person who would rather spend more time in the store sorting out my issues myself and searching for a longer time than asking other people for help...I don't

want to have a lot of interaction with people in the store, I only want staff if I need to talk with them if I need information. I was a little bit concerned that if I used the thing [Paula] a staff member would come and ask me like 'Can I help you with that' and stuff so I was concerned that they would kind of annoy me and I just wanted to check it [Paula] out myself (Huckleberry)

Some participants felt that having Paula there as an option allowed them to avoid social situations with store staff where social anxiety and human judgment could potentially occur. It appears that Paula was perceived as more approachable than human employees.

For me, I get anxiety to speak to a new person...you can get comfortable with Paula because obviously she's a machine and she's not going to judge the way I speak or who I am or where I am from (Poorvi)

She doesn't really look like the judgmental type (Margaret)

I'm someone who struggles a bit with social friction when talking to new people. Less awkward for me when I don't have to do it (Harry)

Such a viewpoint appears primarily based on the unpredictability of new social interactions. AI retail technologies hold a relative advantage over human service employees of being remarkably consistent (Huang & Rust, 2018). They can be designed to remain homogeneous over time and across units (Wirtz et al., 2018). As a result, the uncertainty and unpredictability associated with human-human interaction do not necessarily apply to digital-human interaction. As discussed by Brosschot, Verkuil and Thayer (2016), the uncertainty associated with specific situations often forms the basis for anxiety and stress responses. By removing the human interaction element of physical retail shopping, customers who consider themselves socially anxious and fear judgement from others can enjoy a less stressful and, therefore, more satisfying shopping experience. This finding provides

further insight into the social outcomes of implementing this AI technology within retail environments by contributing a more nuanced account of the impact of retail AIDHs on a relational level, as opposed to merely a transactional level.

2.6 Discussion and Implications

The findings of our study on the actual use of an AIDH in-store have strong practical implications when thinking about the future of CX as retailing enters a period of both transformation and unprecedented change. While those commissioning such technologies envisage improvements in CX and concomitant cost savings, thematic analysis has revealed how consumers use and embrace this new technology and point towards the factors that may need to be accounted for to ensure CX is optimised.

The social tensions experienced and the disruption to everyday shopping practices must be managed, and new practices learned. While customers did not enjoy stress, pressure, nervousness and sensing negative social judgment, CX and satisfaction increased significantly once they understood more of what the new technology could do. While initial advice in our focal study was for consumers to use the AIDH when help was needed, paradoxically, consumers who needed help lacked understanding of how to summon the help effectively or comprehend what they were actually interacting with. Benefits in CX were gained after improving customer training, bolstering knowledge, learning the correct procedures, and conversing with “her” effectively.

Making available guidance on various aspects of in-store practices relating to the new technology is critical to improving CX. This includes providing details on the correct procedures necessary to operate effectively, such as where to stand, what to talk into, which button to press and hold, how loudly to speak, the clarity of communication required, etc. Consumers also welcomed further guidance on what type of questions or statements might be responded to, including the

possibility of using normal conversational gambits for ‘breaking the ice’ and strategies for initiating a conversation with a stranger. At a deeper level, consumers need to know more about the unfamiliar technology when it is in its infancy. Explanations should be available regarding how the technology works; for example, can she actually see the consumer? Is the consumer being video recorded? Will she remember the consumers? What does she do with the information that she receives throughout the conversation? Such training provided by retailers will reduce consumers’ uncertainty, increase the sense of safety, and help develop trust between the consumers and the AIDH as part of the in-store experience.

An unexpected contribution and impact of the AIDH technology on retailing CX in our study was the enabling of social possibilities and opportunities that otherwise would not have existed. Consumers shopping with friends/partners/family were able to interact with the technology in fun and engaging way that very clearly contributed to the CX for those concerned. While this might be a secondary outcome and benefit for retailers (and consumers), it should not be ignored. We believe there are strong arguments to further develop the social functionality of AIDH technology in-store.

Retailers primarily pitch such technology as something that will assist consumers with their shopping journey, while the ‘fun’ factor has been somewhat ignored. The primary purpose of the technology is generally to assist customers with their shopping journey, and the first thing is to ask shoppers, ‘How can I help you?’ We believe there may be potential for replacing the question with small talk to encourage a more social rather than a practical conversational exchange, especially if a group rather than solo shopper approaches. Moreover, extending this agenda, retailers might consider the potential for a broader range of (optional) social/fun interactions. These could be simply designing the AIDH to play short games with shoppers (noughts and crosses, eye spy etc.) or even a guessing game where “she” attempts to guess which type of product the customer wants to buy based on clues the consumer provides her. There is tremendous scope for trialling different approaches using an

AIDH to engender a genuinely pleasing social situation in-store. With this broader agenda, retailers who invest in new AI in-store technologies may see that it contributes incremental increases in CX and that a more significant impact of technology on retail CX is experienced.

There is clear evidence that AIDH technologies engender diverse and paradoxical responses, particularly regarding the need for human interaction/need to avoid interaction. What contributes towards a positive retail CX for one consumer might be the very thing that leads to a bad experience for another shopper. Choice rather than imposed technology is the key to success, considering the social consequences of AI in retail on consumers' experiences and shopping practices. Thus, we believe that at this stage, retailers would do well to think of AIDH not as a replacement for frontline employees but rather as an addition to the physical retail environment (Davenport et al., 2020).

Finally, we note that if retailers AIDHs, the media messages and publicity surrounding the launch of such innovative and ambiguous technology needs to highlight the uses beyond the practical and informational application. The hedonic and social benefits of interacting with an AI digital store concierge can lead to enhanced CX, but the potential is unrealised unless consumers are made aware of this. Thus, there is scope for a nuanced launch communication campaign to mitigate some of the consumers' problems in using unfamiliar technology that leads to poor CX and to highlight the latent and unexpected fun factor.

2.7 Conclusions and Suggestions for Further Research

This paper makes a clear and significant theoretical contribution to the consumer experience and retailing literature by revealing and untangling the social significance afforded from consumers' interactions with AIDHs as part of the in-store shopping experience. In addition to adopting this novel sociological lens, there are strong managerial lessons to be learned about CX from the dataset in this

study. New trends in store-based consumer behaviour have been interrogated, particularly regarding the potential for fun CX within groups as a result of interacting with an AIDH.

Future research opportunities include identifying critical success factors in reducing social tensions and improving CX, and balancing opportunities to interact with real and AIDHs in store. Notably, many future research avenues relate to our findings around fun and the heightened hedonic aspects of CX due to non-shopping-orientated interactions. The marketing and retailing literature remains mostly silent on the wider social significance of AIDHs on the in-store consumer experience, and further studies should be undertaken to unpack the complex dimensions of interactions with human shoppers. Finding new ways to delight and amuse shoppers is central to the future of retailing CX management.



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We, the candidate and the candidate's Primary Supervisor, certify that all co-authors have consented to their work being included in the thesis and they have accepted the candidate's contribution as indicated below in the *Statement of Originality*.

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Chapter Three: Retail AI digital humans and the unintended Digital Matthew Effect: a practice-based understanding

3.0 Abstract

Retailers are implementing AI digital humans (AIDHs) within their stores, offering consumers substantial shopping benefits. In this paper, we draw on the ‘The Digital Matthew Effect’ – situations where social advantages lead to further advantages, and vice versa – and novel practice-informed accounts of consumers’ shopping journeys to investigate how the significant shopping advantages afforded by retail AIDHs may be distributed among consumers. To this end, we explore the diversity of shoppers’ interactions with retail AIDHs to identify specific consumer elements that may cause a disequilibrium of AIDH outcomes, which, to date, are underexplored in the extant literature. We find that differing consumer dispositions, motivations, and competencies lend themselves to multiple meanings associated with favourable and unfavourable consumer-AIDH interactions that draw and repel shoppers from this technology. The interactions examined in this study reveal five dichotomies that enable and prevent shoppers from successfully utilising retail AIDHs to their advantage and provide retailers with insight into how AIDHs are experienced by consumers. We suggest that the AIDH shopping advantages will not be equally distributed among consumers. Our findings add to previous understanding of the social ramifications afforded by retail AIDHs whilst demonstrating the explanatory power of practice theories as a framework for understanding the intricacies underpinning the formation of novel Digital Matthew Effects.

Keywords:

Artificial Intelligence; Digital Humans; Digital Matthew Effect; Human-AI Interaction; Social Implications; Consumer Experience

3.1 Introduction

Powering what is generally referred to as the Fifth Industrial Revolution (Noble et al., 2022; Haenlein & Kaplan, 2021), Artificial Intelligence (AI) technologies are widely expected to have profound impacts on society and the economy (Agrawal et al., 2017) and are now having substantial implications on retailers' frontlines (Guha et al., 2021; Mahmoud et al., 2020). Of particular significance is the recent emergence of AI digital humans (henceforth AIDHs), the specific context of this paper, which are projected to grow by 35% annually (Globe Newswire, 2019). This novel retail object is an advanced tool to assist consumers with shopping practices. AIDHs offer consumers who use them effectively substantial shopping benefits, including a more timely, convenient, personalised, consistent (i.e., free from human error), and reliable shopping experience (Ameen et al., 2021; Wirtz et al., 2018), as well as an increased sense of control over their shopping journeys (Inman & Nikolova, 2017). In addition, their agile and accurate information-providing capabilities enable consumers to make more informed and simplified consumption decisions (Grewal et al., 2017; Schneider & Leyer, 2019). While existing research has discussed the competitive disadvantage that will be cast on businesses who are unable or reluctant to adopt AI into their business practices (e.g. Chatterjee et al., 2021; Oosthuizen et al., 2021; Sutton et al., 2018), to the best of the authors' knowledge, very little, if any, attention has been given to the relative disadvantages that are likely to arise for those consumers who exclude – or are excluded from – engaging with AIDHs as part of their everyday shopping practices. This, therefore, provides the impetus for this paper.

The growth of the multifaceted uses of AI in retailing, and other service sectors, has coincided with concerns about the inequitable distribution of outcomes resulting from the applications of such technologies for different consumer groups (Dwivedi et al., 2021). This has led to calls for further research into potential AI challenges and consequences in divergent commercial contexts (e.g., Belk, 2021; Bryson & Winfield, 2017) to offer insights into the broader societal inequalities arising from AI (Dwivedi et al., 2021).

Despite a World Economic Forum discussion on the future of AI arguing that “no one will be left behind” (Zhou, 2020), it is not clear that all shoppers will attain the shopping advantages offered by retail AIDHs. Extant research has shown that in-store technologies do not have homogeneous or universal appeal (Koronowski, 2010; Moore et al., 2022). Such technologies tend to be more easily integrated and intertwined within some consumers’ shopping practices than others. Thus, rather than serving as a mechanism to equalise social disparities (Coombs, 1998; Hancock, 2001; Wyer, 2001), concerns could be raised about how the significant shopping benefits afforded by retail AIDHs may be unequally distributed among consumers as part of the in-store shopping journey. Arguably, the widespread deployment of the emerging AIDH technology could result in an inadvertent privilege awarded by retailers to some consumers. Other shoppers may be placed at a relative disadvantage due to an inability or unwillingness to engage effectively with such technologies (Carter et al., 2020).

To this end, this paper draws on the concept of the ‘Matthew Effect’ (Merton, 1968) – situations where social advantages lead to further advantages or disadvantages to additional disadvantages through time (Rigney, 2010) – as well as novel practice-informed accounts of consumer practices and shopping journeys to explore and understand the (un)intended social consequence (an AIDH-based Digital Matthew Effect) of retailers introducing AIDHs into shopping environments. In doing so, this paper contributes to a more nuanced and holistic understanding of how relative shopping inequalities may emerge between shoppers who effectively embrace this

transformational and advantageous technology and those who do not by exploring the foundations that may cause a disequilibrium of retail AIDH outcomes.

Specifically, we investigate consumers' differing dispositions, motivations, and competencies and how these elements derive the multiple meanings associated with favourable and unfavourable consumer-AIDH interactions. The specific socio-spatial and temporal contexts that lend themselves to consumers engaging and disengaging with AIDHs in-store are also explored, illustrating the social significance that such technologies afford. Five dichotomies are identified that explain how consumers are drawn to and repelled by the technology and how these enable and prevent shoppers from successfully utilising retail AIDHs to their advantage. This paper unravels the consumer elements, meanings and social contexts that may inadvertently give rise to a specific social implication of retail AIDHs – a novel Digital Matthew Effect – from the widespread application of the technology that is currently unforeseen at this preliminary stage of the AI retail revolution. The consumer-AIDH interactions examined within this paper provide retailers insights into how AIDHs are experienced by consumers in-store.

We begin by setting the foundation of the discussion with a literature review that considers the implications of novel Digital Matthew Effects arising from the implementation of AIDHs within retail stores. Following a discussion of our methodology and case description, we report on an ethnographic study focusing on consumers' interactions with an AIDH within a leading technology and appliance store in Australasia. We discuss the core findings of the study by demonstrating 1) the existence of a novel Digital Matthew Effect that has emerged as an unintentional outcome of retail AIDHs, and 2) new and previously untheorised aspects of digital divides that arise due to shoppers differing dispositions, skills, and motivations that drive them towards, or inhibit them from successfully using retail AIDHs. This paper adds to the growing literature that provides a sociological approach to market-based behaviour, specifically consumption practices (Elms et al., 2016) and their

interactions with emerging technologies (Christensen & Røpke, 2010; Green, 2002). The resulting managerial implications of this study are then discussed, and we conclude by offering suggestions for future research avenues that might build on the findings of this comprehensive – and novel – qualitative case study.

3.2 Theoretical background

3.2.1 The Matthew Effect

The Matthew Effect – defined as the tendency for early dis-/advantages to multiply over time, resulting in the incremental generation of absolute and relative inequalities (Merton, 1968), provides central insights into the mechanisms of the social world (Rigney, 2010). Despite most commonly being associated with socioeconomic disparities (i.e., rich getting richer, poor getting poorer), Matthew Effects are not confined to the economic sphere. Instead, they have been revealed and observed across a broad spectrum of social and business activities, consequently deemed a powerful determinant of social outcomes (Rigney, 2010). The prominence of this effect across many facets of life appears to point toward a fundamental principle of the human experience (DiPrete & Eirich, 2006).

Scientific interest in this phenomenon has sparked considerable research on Matthew Effects across several fields ranging from sociology (Słomczyński & Janicka, 2008), economics (Birkmaier & Wohlrabe, 2014), academia (Hunt & Blair, 1987), politics (Rigney, 2010), to educational outcomes (Kerckhoff & Glennie, 1999; Stanovich, 2009; Walberg et al., 1984), and even biology (Dannefer, 1987). The Matthew Effect has been found in many aspects of our lives. For example, the reading ability gap between excellent and poor readers widens over time (Shaywitz et al., 1995), and the concentration of income and wealth into the top 1% within the United States continues to grow

(McMahon, 2003). Whether socially constructed or a by-product of natural law, derived from genetic, financial, educational, or social means, the outcomes are apparent; Matthew Effects impinge on human lives and shape people's futures (Morgan et al., 2008). They are also evident in connection with the use of digital technologies.

3.2.2 The Digital Matthew Effect

The Digital Matthew Effect was later conceptualised by researchers studying social outcomes and novel inequalities that emerged in conjunction with new technologies (e.g., the internet) (Van Deursen & Van Dijk, 2011), mobile devices (Pimenidis et al., 2009), e-government (Bélanger & Carter, 2009), and educational technology (Swain & Pearson, 2002). Digital Matthew Effects, also referred to as digital divides, have enabled researchers to understand the social outcomes of innovations and initiatives (Van Dijk, 2006) and serve as a useful framework for this study exploring the nature of potential shopper inequalities as a consequence of AIDHs within retail stores.

Previously, scholars have predominantly used the digital divide concept to define the binary division between the technology 'haves' and the technology 'have-nots' (Williams, 2001) – for instance, those who have and those who do not have internet access – whether they are individuals, social groups or people in geographical areas (Norris, 2001). However, as with the practice of reading, the more skilful, more-interested, more-experienced, and more-supported humans are in the best position to use technology to leap ahead. This has prompted many researchers to look 'beyond access' to pay more attention to people's interactions with new technology (Van Dijk, 2006). Thus, while the 'first level' of the digital divide (Norris, 2001) deals with issues of equal access, the 'second level' (Trucano, 2010) concerns itself with the inequality that arises from consumers' varying interests and abilities to use innovations effectively.

The digital divide explains more than the inequalities that arise when some people have access to new technology while others do not. Rather, it encompasses the tendency to gravitate towards or be repelled by innovations. Thus, concerning retail AIDHs, and what this study investigates, there are not only those who have and those who do not have access to this technology but also those that want and do not want, as well as those who can and cannot exploit the shopping advantages of this technology to its fullest extent.

As suggested by Rigney (2010), the Matthew Effect is a missing piece of the puzzle that must be interrogated to understand the social implications of disruptive innovations (i.e., how new technology might disproportionately benefit some members of society). Digital Matthew Effects can contribute to social stratification, which needs to be understood (Sanderson, 2018). It is, therefore, necessary to monitor and explore the potential of new Digital Matthew Effects across emerging domains. However, the formation of a new divide is not always apparent until inequalities have already emerged (Rigney, 2010). This requires a proactive approach to identifying such divides' tipping points (Gladwell, 2006). It is, therefore, necessary to explore new digital divides in their initial stages of development. Given the compelling benefits (both current and future) that emerging retail AIDHs offer consumers (Ameen et al., 2021; Wirtz et al., 2018; Inman & Nikolova, 2017; Grewal et al., 2017) and that consumer-facing technologies tend to be more easily integrated into some consumers' shopping practices than others (Koronowski, 2010; Moore et al., 2022), the potential for a significant novel shopper-based Digital Matthew Effect exists. It is, therefore, necessary to explore the possibility of this (un)intended social consequence of retail AIDHs by identifying the specific elements that may underpin the creation of such a divide, as this paper intends to do.

3.2.3 Retail AI and The Digital Matthew Effect

Some researchers argue that retail consumers are the undeniable winners in the competitive race to leverage AI to enhance consumers' experiences (Byrum, 2018). Other scholars refute such claims, warning against potential social ramifications (Mahmoud et al., 2020) while focusing on AI ethics and fairness (Robert Jr. et al., 2020). Possible problems include the threat of mass job loss (Gomez-Mejia, 2021), cyber security (Bécue et al., 2021), and environmental degradation (Dhar, 2020). In terms of consumer drawbacks from service delivery through AI interfaces, researchers have focused predominantly on a lack of human interaction (Ameen et al., 2021), irritation caused by the technology (Rodgers et al., 2021), and mistrust due to an increased requirement to share private information (Mahmoud et al., 2019).

However, the potential for broader social issues for consumers' emerging from the widespread deployment of AI-powered retail technologies remains relatively unknown in the extant literature (Shankar, 2018). Several researchers have voiced concerns that AI in retail may spark shopping inequalities (i.e. Isensee et al. 2022), with Carter et al. (2020) calling for research on the emerging AI divide across disciplines. The substantial shopping advantages afforded to consumers by retail AIDHs, for example, may primarily benefit specific shoppers and create a disequilibrium of AIDH outcomes. This forms the impetus of the current study; to illuminate how a Digital Matthew Effect may emerge from consumers' unequal usage of the shopping advantages offered by retail AIDHs by uncovering specific consumer elements that determine which consumers may disproportionately benefit from this emerging technology.

Existing research suggests that certain consumer groups are more likely to interact with retail technologies and therefore reap the associated benefits than others (see 'Diffusion of Innovations' in Rogers 1995 and 'Technology Readiness Model' in Parasuraman 2000). Several demographic characteristics have been shown to moderate consumer desire to use in-store technologies. For

example, a generational cohort, gender, education, and income (Lee et al., 2010; Meuter et al., 2003; Weijters et al., 2007) have been shown to correlate with self-service technology use. Puntoni et al. (2021) also identified AI's potential to alienate consumer groups. Aspects of retail AI technologies that contribute to shopper acceptance have also been examined (Pelau et al., 2021; Pillai et al., 2020). However, such research does not acknowledge the complexities of the social contexts in which retail technology interactions occur. What is less known, and what this study addresses by drawing upon the elements within the theories of practice framework (explained in the following section), is a more sociologically informed understanding of the meanings responsible for attracting and repelling shoppers from AIDHs use and, therefore, the elements that contribute to the formation of an AIDH based digital divide. The interplay between a consumer's dispositions, motivations, and competencies and how these interact with the social context to shape consumers' experience with an AIDH while enabling and preventing shoppers from successfully utilising retail AIDHs to their advantage is not currently understood.

3.2.4 Theories of practice and AI in retail

Emerging within the late 1970s, theories of practice have established themselves as a useful theoretical lens to mobilise and investigate the social world (Schatzki et al., 2001). They have restored the actor to the social process without losing sight and without giving more than its due, the cultural structures that both constrain and enable social action (Ortner, 2006). From a practice theory perspective, everyday consumption's mundane, habitual, and routine nature is emphasised (Randles & Warde, 2006).

Research informed by practice theory attempts to comprehend how individuals become skilful actors within communities of practice (Lave, 1993; Wenger, 1998) and how individual practices become interwoven within a broader nexus of related practices (Shove et al., 2012). Previous social

practice-based consumer studies have examined a spectrum of situations in which new consumption/shopping practices have developed and stabilised (e.g., Bulmer et al., 2018; Miller et al., 1998; Warde 200 5). Such consumption studies have concerned themselves with the active and sophisticated nature of consumers' shopping performances' to more precisely understand the social significance and multiple meanings associated with consumption. Drawing on theories of practice enables the conceptualisation of how behaviour evolves over time, specifically, the process of actors transitioning from a position of mastery back to beginner levels of competence when faced with a modified context that disrupts their habits of stable practice (Schönian & Laube, 2013). Introducing AIDHs into retail settings disrupts consumers' deeply embedded shopping practices by modifying the environment in which consumers shop.

Practice theories recognise human agency as a synthesis of social structures/contexts that interact with an individual's specific elements to constrain and enable social action (Ortner, 2006). Through the use of a practice theory lens, shoppers are viewed as active agents (Reckwitz, 2002) whose specific dispositions (Southerton, 2013) (attitudes towards AIDHs, for example), motivations (to pursue the benefits of engaging with AIDHs) and competencies (Strengers et al., 2016) (the skills needed to use AIDHs effectively) shape their experiences within a community of practice (interactions with an AIDH within a retail setting). Practice theories elucidate the specific mechanisms involved in reconfiguring the practice of shopping following the implementation of AIDHs, and therefore provide an appropriate framework for understanding the meanings that enable and prevent shoppers from successfully utilising this emerging and disruptive retail technology. As such, this study analyses the elements that constitute the practice theory framework, namely consumer dispositions, motivations, and competencies, as well as the influence of social contexts, to explore the foundations of a potentially emerging AIDH-based Digital Matthew Effect.

The preceding discussion leads to three interrelated research questions that aim to understand and conceptualise a retail AIDH-based Digital Matthew Effect by revealing the specific consumer elements, meanings and social contexts that may form this novel divide. RQ1: Which consumer dispositions, skills, and motivations enable and prevent consumers from effectively using retail AIDHs? RQ2: What are the meanings associated with favourable and unfavourable consumer-AIDH interactions? RQ3: How do specific socio-spatial and temporal contexts lend themselves to consumers engaging and disengaging with AIDHs in-store? RQ4: What are the social meanings and perceived outcomes that consumers derive from the existence of, and their experience with, AIDHs? These three questions will be used as a basis to develop five dichotomies that draw and repel consumers from the technology, enabling and preventing shoppers from successfully utilising retail AIDHs to their advantage. In addressing these questions, the current research seeks to explore and understand a novel (un)intended consequence (an AIDH-based Digital Matthew Effect) of retailers introducing AIDHs into shopping environments while building a broader theoretical understanding of the intricacies that formulate new digital divides.

3.3 Methodology

Applying a practice theory lens, an ethnographic, single-setting study approach explored consumers' interactions with an AIDH interface within a physical retail store. Australasia's industry-leading national technology and appliance store chain permitted us to study their new AIDH. This case was selected primarily on its inherent characteristics (Koivu & Hinze, 2017) and relevance to the research topic (i.e., the existence of an AIDH within the retail environment). Given the size and status of the retailer and that their AIDH was the first of its kind within the country, this case was considered by the authors to be substantively significant (Beach & Pedersen, 2019) and would provide good learning opportunities for other retailers that wanted to implement similar technology.

Consumers' in-store experiences with this digital avatar provided learning opportunities for other retailers considering implementing similar technology within their stores. Their pre-launch strategy planned for the technology to complement rather than replace front-line human service employees. Our study followed the introduction of the AIDH from the beginning, starting with the opening of a new mall and signature store where their AI employee concept technology was launched.

Consumers' dispositions, skills and motivations when interacting with an AIDH were captured through multiple data collection activities, including observing and interacting directly with shoppers in situ. The observations were conducted at intervals across a 12-month period, with observation diaries that focused on how the consumers were reacting and interacting with the digital human being generated in-store. The lead researcher stood outside the store, looking back into the store, and observed shoppers as they noticed the AIDH and interacted with it. Intercept interviews (Bush et al., 1991) were also conducted when consumers had just finished using the digital human when leaving or entering the store. These informal chats lasted around 5 minutes and were very flexible regarding what was discussed. The main purpose of these was to capture the user's thoughts about the AIDH while the interaction was still fresh in their mind.

Data was also collected through 15 in-depth interviews, and the participants were recruited through personal networks via snowball sampling. We aimed to select a cross-section of adult participants to represent the experiences and practices of various shoppers who had interacted with the AIDH. The participants varied in terms of their level of experience with AIDHs. For the majority of participants, the selected retailer was their primary technology and appliance store. When incremental learning became minimal due to the researchers no longer acquiring new perspectives from participants (Glaser & Strauss, 1967), the concept of data saturation was used to determine when to stop recruiting new consumers for the study. Numerous in-store intercept interviews were conducted before, during and after shoppers interacted with the technology to capture immediate shopper reactions to the AIDH.

Contextual and background case information was gathered through interviews with the technology developer and retailer staff (store staff, store managers, customer experience and operations managers). Online media reports relating to the launch of the AI interface were also collected before and after the launch of the new technology. All interviews were audio recorded and transcribed.

A summary of the 15 research participant’s profiles highlighting gender, age and some occupation and family situation follows in Table 2. The participants have been allocated pseudonyms.

Table 2: Pseudonyms and profile of interview participants (Paper 2)

Pseudonyms	Participant Profile
Andrew	Male, late 30s, lecturer, single, high-level of technological proficiency
Diana	Female, early 30s, newly married, first-time using the AIDH
Dwayne	Male, late 50s, stepfather of three, often visits the store with his grandchildren
Hugo	Male, late 40s, media director, newly married, has used the AIDH multiple times
Jacob	Male, early 30s, business analyst
Lisa	Female, mid 30s, mother of three, low level of technological proficiency
Lucas	Male, early 20s, builder, mostly purchases gaming products from the retailer
Maria	Female, late 60s, retired, low level of technological proficiency, first-time using the AIDH
Michelle	Female, late 50s, secondary school teacher, mother of three
Pablo	Male, early 40s, newly married, first-time using the AIDH
Preet	Female, mid 20s, beauty therapist, new mother, has used the AIDH multiple times
Ram	Male, early 30s, banker, was shopping with his wife and young son when approached by the researcher
Sarah	Female, early 20s, police officer, single, was in-store to purchase headphones
Stan	Male, early 60s, courier driver, was shopping alone when approached by the researcher
Young	Female, early 30s, master's student, first-time using the AIDH

3.3.1 Data analysis

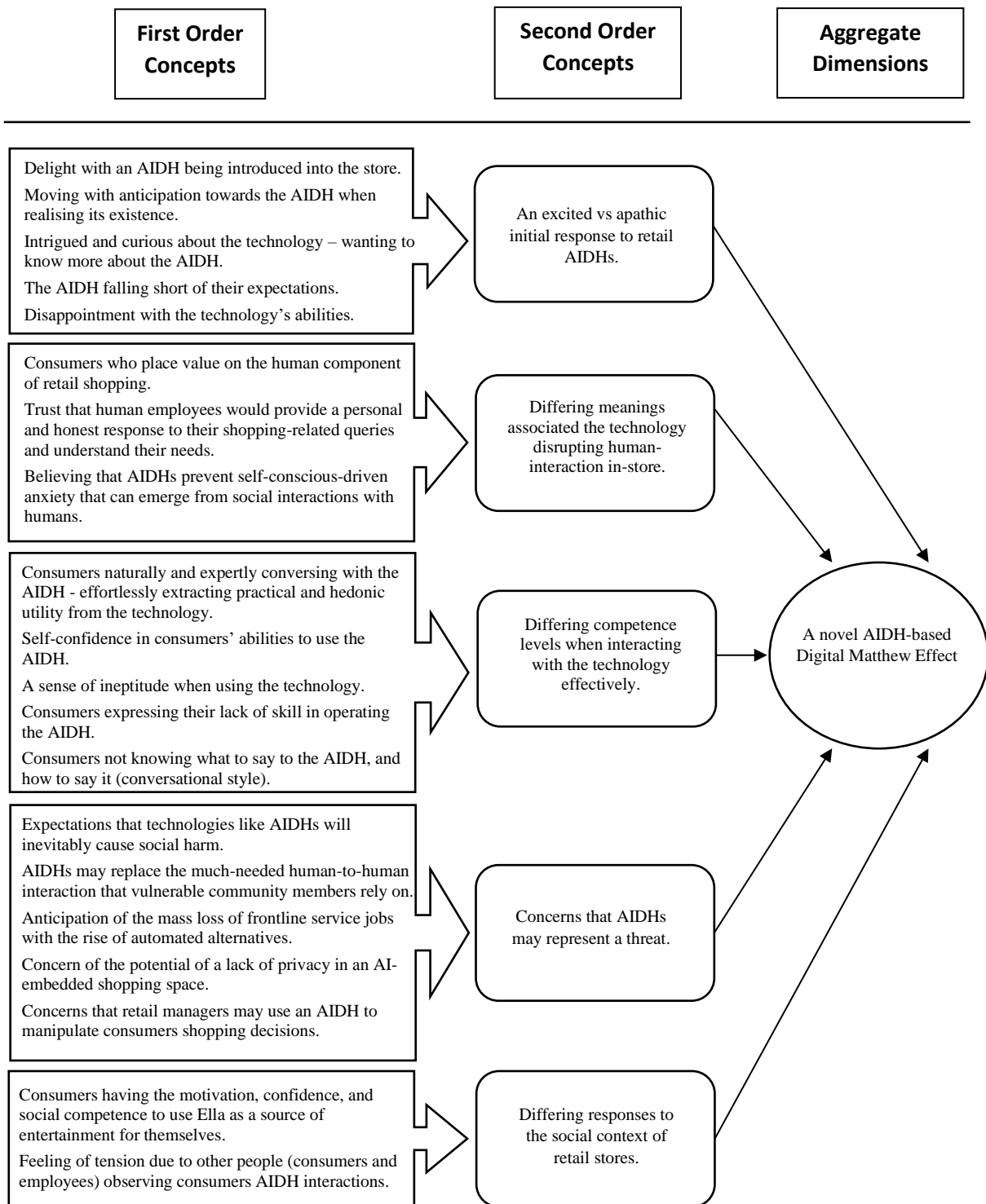
An iterative process was used to analyse documents and interpret our findings. The data was analysed concurrently with data collection using an iterative approach involving constant reiteration between data collection and analysis to take full advantage of the flexibility that the case research method affords (Eisenhardt, 1989). Aligned with the abductive reasoning approach (Glaser, 1978; Spiggle, 1994), our understanding of consumer practices with the AIDH ‘emerged’ from the data in the absence of any preconceived theories or hypotheses. The researchers adopted grounded theory techniques when carrying out the analysis (Glaser, 1978) to identify several themes grounded in the lived experiences of the participants that progressively contributed towards a more abstract understanding of the research topic.

To become familiar with the dataset, the initial stage of the analysis involved reading and re-reading all records, allowing the researchers to develop a rich understanding of the data from different perspectives. At this stage, we identified and collected relevant data extracts that served as the basis of our analysis. (Corbin and Strauss, 2008, Glaser, 1965). Our primary interest was how consumers’ differing dispositions, motivations, and competencies derive favourable and unfavourable interactions with the AIDH.

Subsequently, we followed the three-level coding model elaborated by Gioia et al. (2013), which involved the data being organised into a data structure. This was developed by the lead author using a process of open coding (to derive first-order concepts from our data) where textual extracts related to similar issues were grouped together. These first-order codes were then grouped into second-order themes using axial coding by relating the codes and categories identified through the open coding phase to identify relationships within the concepts and themes (Spiggle, 1994; Strauss & Corbin, 1990). The elements encompassing the theories of practice framework were used to form the basis of an initial coding scheme, with categories evolving as additional data was collected. A

sample data coding structure is provided in Figure 4. The themes that arose from the analysis were selected primarily on their connection to research objectives. The researchers do not claim that every possible angle that could have emerged from the data has been exhausted. Data was excluded if it did not shed light on the social dimensions of AIDHs in retail. The authors referred to the relevant literature consulted throughout the formation of these themes to ensure that they had theoretical relevance. Discussions between all three authors considered rival interpretations of the core themes before final interpretations were agreed upon.

Figure 4: Sample data coding structure



3.4 Case Description

The AIDH investigated in this study was presented in a kiosk at the entrance to the store. For the purposes of this paper, we are calling the AIDH by a pseudonym, Ella. A large screen displays a

youthful female visage of Ella with question-and-answer capabilities and voice-to-text recognition software. Ella, dressed in the store's staff uniform, is a human-like avatar that appears to blink, smile, talk and respond in a natural conversational way. Ella senses their presence as shoppers approach and greets them as a human employee might. Shoppers then stand in front of Ella, press an activation button, and speak to her through a microphone mounted on a stand directly in front of the interface. The system is supported by a database of queries and answers designed to be updated as her training and learning progress. When Ella cannot answer consumers' questions, the AIDH connects them with human staff members who are also present within this retail environment. This includes Ella providing the staff member with details of the ongoing conversation with the shopper. Ella's primary purpose is to enhance the in-store shopping experience and support customers throughout their shopping journey by acting as a digital version of a store employee.

3.5 Findings

The dataset analysis revealed five broad dichotomies representing the experiences of consumers drawn to or repelled by Ella. These themes relate to shoppers' (1) dispositions that determine an excited vs apathetic initial response to AIDHs, (2) beliefs about how the technology will affect human-interaction in-store, (3) competence to interact with the technology effectively, (4) beliefs that AIDHs may represent a threat, and (5) responses to the social context in which retail AIDHs take place. These themes elucidate the multiple meanings associated with favourable and unfavourable consumer-AIDH interactions that enabled and prevented our participants from successfully utilising retail AIDHs to their advantage. Our findings, discussed in this section, highlight that Ella does not have universal appeal as our participants' responses and experiences with her varied extensively due to their differing dispositions, competencies, motivations, and responses to the social context in which Ella interactions occur. This variance signals the beginning of a divide

between shoppers; those who can or will successfully utilise retail AIDHs to their advantage and those who can or will not. This implies the formation of a new Digital Matthew Effect. This section provides evidence of the five dichotomies while unpacking the multiple meanings and rationalisations that gave rise to the favourable and unfavourable consumer interactions with Ella.

3.5.1 An excited vs apathetic response

The existence of Ella within a retail store generated excitement among many consumers at first glance. Some consumers appeared temperamentally inclined to respond to Ella with excited curiosity. This response occurred immediately after realising they were about to interact with an AIDH, i.e., before any contemplation was possible.

“It was definitely a bit different when I saw her, I really wanted to try it because it was something new and I thought it might be useful” (Lucas)

“It’s pretty cool that they have that in-store, not really something you would expect in this country to be honest” (Jacob)

“I remember feeling really impressed by the fact that they actually developed her in that way” (Sarah)

As Beatty and Talpade (1989) suggested, individuals prioritising thrill, happiness, and adventure tend to seek situations where excitement may ensue. It was common to observe consumers with such dispositions moving with anticipation towards Ella when realising she was an AIDH. Consumers were frequently observed being excited during their first enthusiastic interaction with Ella. We witnessed shoppers reflecting on potential ways that Ella could assist them in solving some of their shopping-related concerns, stimulating their interest in exploring her competencies. Study

participants expressed their excitement and interest regarding the continual advancement of cutting-edge technologies.

“It’s quite surprising how to see what’s available now [AI technology] and quite exciting to see how it keeps developing ... it’s finally here” (Maria)

While an abundance of excitement was present when observing some consumer-Ella interactions, other consumers, with their differing dispositions, responded to Ella with apathy. These consumers tended to focus on the practical limitations of the technology rather than the potential shopping advantages it may offer.

“I was hopeful that it [Ella] would just do everything that I need [as a customer] ... I’m better off just using Siri... I felt a little disappointed, and frustrated ... [Ella] came off a bit superficial with the whole process of having to press the button, then speak, then watch it load while it worked out what it was going to say back” (Pablo)

“I probably thought that it would be more advanced like I thought it would be able to tell me about free-standing ovens, but it didn’t know” (Michelle)

“When I was asking Ella a few questions about a few different products it seemed to be quite slow and didn’t understand what I was asking at the time” (Lucas)

Participants often displayed apathy when Ella fell short of their expectations of what AI technology could do. This often arose when Ella could not answer casual questions that consumers expect human employees to answer routinely, such as “How was your weekend?” and “Have you been busy?” Disappointment from these moments of interaction appeared to drive apathetic consumers to ask themselves, “Why make an effort if it does not improve anything?”

“The feeling I got is that maybe [Ella] is not so hot. Maybe her potential is but at the moment she hasn’t proven much ... Ella didn’t have that pull that made me really want to go and talk to her” (Young)

3.5.2 The Human Element

The second theme was the contrasting responses to finding that human employees were being replicated by a non-human object within the physical retail setting. This abrupt change in the social environment within which consumers shop caused unrest among some participants who place value on the familiar human component of retail shopping. Some participants responded this way because they tend to enter physical retail stores with motivations beyond purchasing objects, for example, to seek human interaction. For these participants, Ella was perceived as an obstacle to their human interaction needs.

“Human interaction is a thing that humans need...I mean you could talk to a computer but you’re not going to get the same sort of a feeling as talking to someone else and having banter with them” (Lucas)

“She didn’t feel inviting, there wasn’t something warm about Ella ... the lack of humanness, I guess. And she made me realise in a way that I value the humanness” (Young)

“At least I would be able to talk to someone human, that’s just me ... In some cases, I wouldn’t mind like showing me when things are but going in-depth into talking to a person on screen would not be very attractive to me” (Maria)

Other participants preferred human employees as they perceived them as capable of understanding their specific needs in a way that a technological alternative would not be able to. These participants trusted that the store’s human employees would provide them a personal and

honest response to their shopping-related queries. Such participants felt Ella was limited to generic responses and inferior to a human employee.

“It wouldn’t be the most convenient option if you were looking for something specific where you actually needed to discuss certain features and things like that ... I think she can direct me to certain places and give me product info, but I don’t think she would be able to answer the questions I typically ask the store assistants like ‘what’s better, the Beats or Sony headphones?’ ... I feel like it’s more of a human question because it’s based on preferences and the store guy [employee] is likely going to say, ‘Well I tried these Beats, but they fell out when I was running. Or that customers have brought back the Sony a lot because they are not sweat resistant’ or something like that” (Sarah)

“I prefer talking with human employees so I can explain the background behind it and the context of what I’m looking for and why I want it” (Dwayne)

“If there is an option to go to a real person, I would go to the real person” (Michelle)

“I would prefer a human employee to help me with my problems ... I could ask different questions and get proper answers” (Maria)

While the lack of real human interaction discouraged some consumers from embracing Ella, the need to avoid human interaction caused other consumers, with differing motivations, to welcome her with open arms. Ella offered consumers of this nature a resource to prevent or mitigate the self-conscious-driven anxiety that can emerge from social interactions. As such, many study participants favoured interactions with non-human technological objects and therefore were positively predisposed towards Ella.

“Ella is better than talking with a human. You avoid any kind of awkwardness or having to wait around to find somebody [human employee] to direct you... In general, I want to avoid any awkwardness and anybody else’s judgement” (Pablo)

“If I can get away with asking an Ella type thing I would ... You’re not judged, the answer is really quick, and you can move on type thing, it’s a lot easier” (Dwayne)

“You can see the benefits straight away in that if you do not want to have a human interaction, which is quite often, then you can just go to it ... I wouldn’t consider things like ‘I haven’t brushed my hair’ if I was talking with Ella but I would be thinking ‘oh my God’ [if talking with a human employee] ... She doesn’t ramble on to you ... I like how I don’t have to make up a conversation to have with her ... You have to sit there and think of excuses as to why you’re not going to buy [a product when interacting with a human employee], you feel like you have to justify yourself to someone [when interacting with a human employee]” (Sarah)

When asked if the same tension would apply to an Ella interaction, she said, “No (laughter), I probably wouldn’t even tell her.” When asked if she felt anxious about approaching a human employee, Sarah replied,

“Yes definitely. And on top of that you feel a little bit of worry about the disappointment that the person won’t actually know the answer, then you have to go through that whole process again of finding another person and interrupting their day” (Sarah)

3.5.3 Consumer Competence

The third theme came not from aspects of Ella herself nor the perceived outcomes of her existence but from consumers’ ability to interact with Ella in a meaningful and successful manner. Many consumers were observed, often to the authors’ surprise, naturally and expertly conversing with

Ella. These competent Ella-users could effortlessly extract practical and hedonic utility from the technology. The interviews reinforced this observation as some participants displayed and revealed self-confidence in their abilities to use Ella effectively.

“I felt confident that I could communicate with Ella, I had to like be a little clear but not talk to [Ella] like we are talking now” (Pablo)

“I just spoke to her as if she was a computer which made it easy, and she was able to understand me” (Michelle)

“I didn’t doubt my ability to use Ella” (Young)

Other consumers’ attempts to interact with Ella lead to less effective outcomes. These consumers, with relatively less expertise, were discouraged from interacting with Ella and less capable of deriving practical utility from her. It was common to see would-be Ella-users stand in front of her, searching for clues about what to do before walking away. These experienced and competent shoppers were confronted with an unaccustomed sense of ineptitude when faced with this unfamiliar technology that disrupted their shopping practices. Some participants expressed their lack of skill in operating Ella when reflecting on their experiences.

“At first when I walked in and saw the screen [Ella], it kind of looked like I could just talk to her at first, but I didn’t know how to really use her” (Michelle)

“I’m sure some people would like it [Ella], but I’m not really good with this kind of stuff...I usually end up just not using it” (Stan)

Doubting one’s ability to execute the procedures and sequences required to use Ella successfully influenced our participants’ interest in interacting with her. A lack of competence also appeared to limit Ella’s usefulness, discouraging such consumers from future use. Ella requires her

users to have the skills to initiate a conversation and interact with her in a communication style that differs from the typical human-human conversation. Many consumers lacked the understanding that Ella was limited and not smart enough to understand their natural language and communication style. For example, we witnessed an interaction where the consumer wanted to purchase a portable air conditioning unit. The consumer asked, “Hi Ella, can you tell me about your air conditioning units... the portable kind?” In this instance, the lack of a complete sentence triggered a comprehension issue for Ella, and she could not respond.

Moreover, with Ella being designed to mimic a human's intellectual, visual, and audio nature, tensions developed as shoppers struggled to determine whether to talk to her like a human or a computer.

“Speaking slowly and making sure it understands me is the big issue for me. I mumble a lot, so I ask for something and [Ella] gives me a completely different answer sometimes. So, it could be my fault ... It was very unusual dealing with [a digital human] because you’re so used to dealing with people and all of a sudden, you’re talking to this computer screen and you’re not really sure what to do” (Dwayne)

When the researchers asked Diana about her understanding of the types of questions that can be presented to Ella, the tone of the voice needed, and how clearly one must speak to Ella, this participant noted:

“I didn’t feel confident using [Ella]... I felt like you had to be really specific in what you were asking, and you lost the banter. And it’s hard to become more precise in what you wanted from her” (Diana)

Failure of the AI often felt like a failure for the shopper. Observations further revealed this was a particular issue for those who lacked English fluency and spoke with a heavy accent. When

asked questions regarding their understanding of how to talk with Ella, answers such as “not so much” were common among such consumers.

3.5.4 A Disguised Threat

While some consumers viewed Ella as an impressive piece of software engineering, others felt that Ella was risky and represented a disguised threat. Several participants expressed concern regarding their expectations that Ella-like technologies will inevitably cause social harm. Beliefs about the potential negative social consequences of widespread AI automation resulted in an immediate rejection of the technology among some consumers. This formed the fourth theme.

Consumers who resisted Ella cited concerns that AIDHs may replace the much-needed human-to-human interaction that vulnerable community members rely on, resulting in loneliness for those who depend on service employees for part or all of their human interactions.

“Shopping has always had a big social connection to it ... People who live alone, for example might be relying on human interactions in shops” (Michelle)

“There is also people’s interaction with other people. I know for instance if you live by yourself, and you don’t go out that often the supermarket can be quite a big deal in actually interacting with people and that could be taken away from you because you don’t actually get to talk to a person like an employee. That can be concerning” (Dwayne)

Ella was also perceived as a technology that would generate economic consequences. Some participants expressed discomfort surrounding the anticipation of the mass loss of frontline service jobs with the rise of automated alternatives. Many researchers have described AI as a threat to human service jobs (Huang & Rust, 2018; Kim et al., 2021), with some participants in this study viewing Ella as a giant leap in that direction.

“With the self-service stuff, I’ve always been a bit like well that kind of puts people out of work in a way” (Pablo)

“These [frontline service] jobs are crucial for 15- and 16-year-olds for experience to boost their understanding of work ethic, how to engage with customers, how to engage with bosses, how to turn up to work on time, how to not let your teammates down, these are crucial things, sort of DNA setting things when it comes to employment. These hold you instead as you go through life” (Dwayne)

“It looks bad in my opinion because you’re basically saying humans can’t really do their job properly and you’re taking a job away from somebody who could be doing that” (Lucas)

In addition to a lack of trust in AIDH technology, trust concerns in those controlling Ella were widely discussed among the more circumspect participants. These participants were apprehensive and felt threatened by the potential of a lack of privacy in an AI-embedded shopping space.

“I have a feeling that this type of technology is constantly listening ... Concerned about privacy and what you say being taken out of context and that kind of information being passed on ... A bit of caution as well I would say. Like, I do not think I’m trusting quite yet” (Diana)

“I thought ‘, Can she actually see me? And I thought straight away ‘, Well there is a camera there.’ So yeah, you think ‘, So who is actually watching?’” (Sarah)

This indicates that some consumers need clarification regarding the intentions of the technology. Such participants lost trust in Ella as they sensed that the managers and executives who control Ella might be using her to hijack their agency and subjugate their consumer decisions.

“From what I understand, AI and these digital humans are going to be able to perceive certain vulnerabilities in the customer which will make them more persuasive [sic] to buy something that they didn’t want or need” (Michelle)

“I feel that there may be some bias. Like there might be some programming, for example, if [the store] wants to sell some Panasonic TVs. So, if I ask Ella about TVs, it might tell me about Panasonic only because it’s programmed to do so. Because if I owned a store I would get [Ella] to tell the consumer exactly what I wanted it to tell them” (Dwayne)

Others felt that they were being steered towards using Ella. They felt as if the high profile afforded to Ella by the store’s employees and management (as well as the hype surrounding her launch) was forcing them to value and appreciate the technology, as illustrated by Young’s comment:

“You can feel pressure, when someone is showing you something, to [offer]some positive feedback ... and I feel you’re supposed to like [Ella]. You’re supposed to appreciate [Ella] and you’re supposed to respond positively...I felt like I was trying to be hard sold on Ella [by the store] and that my apprehension wasn’t going to be validated. I didn’t feel I was free to like Ella to the degree that I wanted to like [or dislike] her” (Young)

Ella also generated other concerns regarding the potential safety of retail environments that consist mainly of AIDHs with few human employees. When reflecting on this hypothetical shopping environment, one participant suggested that humans would be more helpful and empathic in crises than AIDHs.

“I think there is a safety side of things as well with having people around you as well. If you went into a supermarket that closes at 11 pm and you’re in there at 10.45 and there is nobody else there, just you and a bunch of AIs, you would feel a bit like, ‘Well this is weird’. I would feel less safe” (Pablo)

Viewing Ella as a disguised threat coincided with a cautious and reluctant approach to Ella. In their attempts to comprehend and make sense of an AIDH occupying their shopping environment, some consumers adopted the role of a knowledgeable resistor, actively resisting the technologically

driven development of shopping practices. Consumers of this nature engaged in avoidance tactics and would disengage with Ella when realising what she was. When asked during intercept interviews whether they had previously used Ella, some responses included, “No, I don’t think I want to,” “I’m just not interested”, and “I don’t want to be asked to use it.” Such resistance became apparent to the observer when a consumers’ replied to Ella’s question, “Can I help you with anything else?” in a semi-confrontational manner (i.e. “definitely not” or “not at all”)

3.5.5 The Social Context

The social environment of a busy shopping mall where interactions with Ella occur was widely alluded to when participants reflected on their interactions with the AIDH.

“Say you’re walking along a footpath, right? Just a normal footpath. Now you put that same footpath on the top of Mt Everest. You’re not walking the same, are you? Even though the footpath is exactly the same. Because we worry about other people, it completely changes the context when other people are around [when using Ella]” (Dwayne)

“The whole environment counts, and who you’re with is a huge part of that ... When I’m interacting with Ella and I’m not just talking with her, I’m also looking at Ella, looking at my partner, thinking about their interaction [too]” (Young)

The social nature of Ella interactions appeared to encourage or discourage consumers from engaging with her. Some consumers possessed the motivation, confidence, and social competence to use Ella as a source of entertainment for themselves and their ‘audiences.’ Such shoppers often found amusement in testing Ella’s conversational competence by presenting her with humour-based questions to provoke laughter from their shopping companions (as well as onlooking strangers). Such opportunistic consumers tested Ella with questions such as “Ella, do you enjoy your job?”, “Ella, do

you have legs?” or even “Ella, are you single?” in an attempt to showcase their wit and entertain their spectators. These shoppers could naturally connect with Ella, seamlessly integrating her into their shopping practices.

“I have fun with [digital humans]. Bear in mind when I’m at the airport and the kiosk tells me to ‘have a safe journey’ I talk back. I don’t do this when I’m by myself because there isn’t another human there to laugh” (Michelle)

“You kind of ask her silly questions to get a response. You kind of antagonise her, to see how far you could push her” (Diana)

“You could sit there all day and play with Ella if you wanted to” (Dwayne)

In contrast, the social environment had the opposite effect on other consumers by repelling them from engaging with Ella. Often this was due to tensions that arose as multiple people (consumers and employees) observed their ‘performance’ as they engaged with Ella. For instance, when Pablo was asked if he thought that others around him were assessing the quality of his questions to Ella, he said:

“Yup, I had kind of a focus that I wanted to ask like a good question ... If I was by myself, the need to ask good questions would be zero (laughter). 100%” (Pablo)

This was the case for many participants, as their lack of enthusiasm resulted from other people around them. Such participants often alluded that their Ella interactions would have been more pleasant if held in a private, non-social context.

“Maybe it’s me because I’m more on the shyer side. So, if I was by myself, I would have asked her more questions, I would think. [If I were by myself] I think I would have felt more comfortable... I’m a bit self-conscious. I would feel a bit self-conscious with people around

me watching what I'm doing. I would prefer to be on my own to ask the questions, you know"
(Maria)

"If I was having jokes with Ella, I feel like I would be judged on how witty I am, or how unique I am, or what silly questions I'm asking ... I mean honestly, when you present that situation to me [where other people are observing interactions with Ella] my brain thinks that I would just bypass Ella and just ask the store assistant ... I probably would have asked her more questions and spent more time having interacted with her [by myself] ... Having people there was like, I have to ask socially appropriate questions" (Sarah)

"You know if lots of people are waiting and I'm talking to this digital human, maybe they get pissed off because I'm wasting their time ... I would feel embarrassed" (Stan)

The following section interprets and discusses the significance of these five themes in terms of how they inform an understanding of in-store AIDH experiences and how they relate to the formation of a novel Digital Matthew Effect.

3.6 Discussion and Theoretical Contribution

Drawing upon the lexicons of social practice theories, this paper provides theoretical contributions by exposing the significant variance of shoppers' responses and experiences with retail AIDHs. The consumer-AIDH interactions examined in this study have identified and unravelled five dichotomies that elucidate the multiple meanings associated with favourable and unfavourable consumer-AIDH interactions. These dichotomies reflect the consumer elements, meanings and social contexts that draw and repel shoppers from retail AIDHs and that enable and prevent consumers from successfully utilising the significant shopping advantages offered by the technology.

We, therefore, suggest that the shopping advantages offered by retail AIDHs will not be equally distributed among consumers. Empirical evidence has demonstrated that a new shopper-based Digital Matthew Effect may inadvertently emerge from the presence and advancement of retail AIDH, the foundations of which have been understood by this study. This represents a novel and previously undiscussed social consequence of retailers introducing AIDHs into shopping environments by taking the academic discussion of the implications of retail AIDHs in a new direction (i.e., the emergence of shopper inequalities). Moreover, by demonstrating how Digital Matthew Effects can be understood and take shape due to elements derived from the practice theory framework, this paper contributes to the Digital Matthew Effect literature, specifically, the intricacies that underpin their formation.

3.6.1 An excited vs apathetic response

A consumer's dispositional reaction to retail AIDHs, whether excited or apathetic, varies significantly among consumers and impacts their propensity to act in a particular manner when exposed to this type of technology. While excitement drives an impetus to engage with the AIDH, an apathetic response often leads to the abrupt abandonment of interactions and the dismissal of the technology as a valuable object. This builds on the technology readiness (TR) construct (later renamed TRI 2.0 by Parasuraman and Colby 2015) by providing preliminary insights into the drivers and inhibitors of technology readiness related to retail AIDHs. By demonstrating how consumers differ in their initial natural reaction when exposed to AIDHs, the role of dispositions in shaping consumers' experiences and intentions of using this retail technology is better understood.

3.6.2 The Human Element

Consumers who favour technological rather than human interactions appear positioned to benefit from the shopping advantages offered by AIDHs compared to those who remain motivated to embrace and preserve the human element of shopping experiences. While the retailer studied in this research provides the traditional interpersonal service option along with the AIDH, this did not deter some consumers from believing that this is the thin end of the wedge and might be the beginning of the end for retail human-human interactions.

Our study suggests that given the potential scope that AIDHs have for replacing human employees, AI may have a more substantial effect on consumers' concerns (regarding human interaction and jobs within retail stores) than other self-service technologies (SST). This aligns with the stance taken by Bock et al. (2020) and Martínez-Plumed et al. (2021), who suggest that AI is far more transformative, disruptive, and complex when compared with other forms of consumer-facing retail technology. This finding builds on studies that have compared self-service vs interpersonal methods of service delivery (e.g., Collier and Kimes, 2013; Dabholkar & Bagozzi, 2002; Evanschitzky et al., 2015; Lee & Yang, 2013; Prendergast & Marr, 1994; Reinders et al., 2008; Verhoef et al., 2009) by furthering our academic understanding of the motivations to engage, or not engage, with consumer-facing retail technologies.

By exploring the meanings that drive a desire to avoid human interactions and the social anxiety that can be attached, our findings align with Jackson and Everts' (2010) research on anxiety as a social practice. Jackson and Everts (2010, p. 1) claimed social anxieties to be "events that rupture the fabric of everyday life, creating specific subjects and objects, 'framed' by different communities of practice, and becoming institutionalised to varying degrees". From this perspective, social anxiety plays an active and influential part in shoppers' motivations and interactions with AIDHs, when

acknowledging and accounting for the robust social contexts within which experiences with the technology occur.

3.6.3 Consumer Competence

Our results have highlighted the importance of competence when engaging with a retail AIDH. A consumer's understanding of the conventions and standards of using this technology dramatically influences interaction quality. Consumers possess vastly differing levels of competence in relation to the goal of effective AIDH use, with those who have the skills to operate AIDHs competently standing to benefit from the novel shopping tool disproportionately. The participants who lacked a rudimentary understanding of AIDHs could not engage confidently with the technology. Self-efficacy when using retail technologies, as described by Dabholkar and Bagozzi (2002) and Flavián et al. (2022), also appears crucial in positive retail AIDH interactions. While technical skill is essential when using an AIDH, as it is when operating other forms of SSTs (e.g., Dabholkar and Bagozzi, 2002; Elliott et al., 2012; Flavián et al., 2022; Kaplan & Haenlein, 2019), AIDHs require their users to possess a new skill set – the ability to communicate in a style that is conducive to the technology's language comprehension software. This adds to understanding the communicative differences between human-human and human-technology interactions (e.g., Hill et al. 2015) while refining awareness of how a consumer's competence shapes their experience within practices. While Chattaraman et al. (2019) examined the effectiveness of different conversational styles employed by AI conversational interfaces, we have looked at the flip side of the coin (i.e., issues related to the conversational style of humans as they attempt to engage with retail AIDHs).

By focusing on competence, this paper has described the pressures put on the competent shopper who is faced with the prospect of modifying their shopping practices by acquiring new competencies and breaking ingrained habits to make way for AIDHs. AIDHs make consumers feel

that their extant shopping knowledge and skills may no longer suffice. Since shopping practices are deeply embedded within domestic routines, shoppers are resistant to change (Jackson et al., 2006). Consumers differ in the extent to which they can adapt to the deployment of AIDHs. Our findings add to the works of Shove et al. (2012) by emphasising the tension-ridden process of actors transitioning from a position of mastery to beginner levels of competence when faced with a modified in-store context that disrupts their stable habits and practice.

3.6.4 A Disguised Threat

Many shoppers view AIDHs primarily based on their perceptions of the potential social consequences of the technology. This causes such consumers to take a far more cautious and distant approach towards the technology when compared to less concerned consumers. Parasuraman (2000) suggests discomfort is a primary inhibitor of technological readiness. This appears accurate for those participants who identified potential threats in the AIDH, most of which related to the loss of the human element of retail environments. It is well understood that humans are intensely social beings, biologically inclined to exist within stable social networks through strong connections with other humans (Berscheid, 2003). The human brain is fundamentally adapted to develop within a social context (Grossmann & Johnson, 2007) and is neurochemically wired to do so. This explains why some participants perceived the idea of fewer humans within retail stores as a threat. Having ‘fake humans’ may run the risk of transforming retail spaces into suboptimal environments that are not conducive to humans, particularly for people whose social opportunities are limited to retail contexts.

While Pelau et al. (2021) found that anthropomorphic AI devices can be perceived as a threat to human identity, Ameen et al. (2021) found that it was unclear how security concerns shape consumers’ interactions with such innovations. Our results have contributed to this theoretical gap by

exploring some unique contexts and factors that give rise to security concerns while demonstrating how these can change how consumers interact with retail AIDHs.

The findings have built upon Ameen et al. (2021) observations that trust and consumer experiences are closely related during AI-embedded interactions by better understanding how trust relates to AIDHs from the consumer perspective. The lack of trust that emerged from a sense that the AIDH is deceptive and used by managers/executives to subjugate consumers' shopping decisions can be understood, in part, by the Persuasion Knowledge Model (Friestad & Wright, 1994). The model explains how consumers acquire knowledge about potential persuasion and use this to withstand possible manipulation (Friestad & Wright, 1994). Such knowledge was developed and stored in the minds of some participants, ready to be used during interactions with an influence agent (such as an AIDH). This informs a cautious and reluctant approach to engagements with AIDHs and illustrates how a consumer's acquired knowledge of practice shapes their experiences and the meanings they assign.

Can an AIDH be expected to behave in a way or enact a role that aligns with typical human behaviour or not? Human beings are constrained by broad cultural norms which contain and enable social action (Ortner, 2006) that members of a group tend to adhere to (Rakotonirainy & Obst, 2009). These norms are used to predict the behaviour of other humans or "taking the role of the other" in role theory terms (Mead, 1993). However, these norms are not necessarily transferable to AIDHs, regardless of what their human-like nature would imply. This study has shown that the process of role-taking, described by Coutu (1949) as "anticipating the expectations of others and adjusting one's behaviour selectively as a result" (p. 31), is complicated when applied to 'social interactions' with AIDHs. This uncertainty may explain why safety became a theme within our dataset. The question of "Exactly how human is an AIDH" is a request that some consumers need to be addressed before they are willing to trust and embrace AI in retail.

Some consumers, as observed within this study, employ tactics to avoid the burden of developing new shopping practices. Through such resistance tactics, these consumers appeared to subvert and contest how retailers attempt to deliver their service (i.e., service delivery through AIDHs). This observation reinforces the ideas of Jackson et al. (2006) and Elms et al. (2016), who emphasise that consumers are skilful agents rather than passive entities capable of taking power back from retailers.

3.6.5 The Social Context

Service encounters have traditionally been considered social encounters (McCallum & Harrison, 1985), with many researchers acknowledging the socially embedded nature of consumers' shopping practices (Alexander et al., 2008; Jackson et al. 2006). This was the case with consumers' interactions with AIDHs, as we observed how the social context could make or break consumers' interactions with the technology. The social influences discussed at length among our participants sometimes came from interactive sources (i.e., direct dialogue with employees and other consumers). However, they were predominantly from various non-interactive social forces. Argo et al. (2005) defined a noninteractive social presence as a non-engaging social entity that is physically present while an agent performs a practice. The most significant social influence on our participants was the background shoppers and employees who did not engage with them but were within proximity of their interaction with the AIDH.

Contrary to what is reported in the technology adoption-based literature (e.g., Parasuraman, 2000; Rogers, 1995), the impetus to engage or avoid the AIDH came from other people around the shoppers during the AIDH interaction. For many of our participants, the social implications that AIDHs generate became prominent in the meanings assigned to the technology, illustrating the social significance that AIDHs afford. This finding aligns with Miller et al. (1998), as they discovered that

shopping is as connected to social relationships as a means to acquire necessary commodities. While Moore et al. (2022) found that AIDHs can be used by consumers as a social resource, this paper unpacks how social dimensions can draw or repel consumers from utilising the shopping advantages of retail AIDH, depending on the consumer's temperament and social motivations/competences. Identifying the social dimension as an aspect of Digital Matthew Effects is a new contribution to literature.

3.7 Conclusion

This paper has investigated how consumers' differing dispositions, motivations, and competencies and how they lend themselves to multiple meanings associated with favourable and unfavourable consumer-AIDH interactions. Using the elements of practice theory, five dichotomies that draw and repel consumers from the retail AIDHs have been identified and explained. These dichotomies enable and prevent shoppers from successfully utilising the retail technology to their advantage and may therefore create a disequilibrium of retail AIDH outcomes. They, therefore, represent the foundations of a potential AIDH-based Digital Matthew Effect. How socio-spatial and temporal contexts lend themselves to consumers engaging and disengaging with AIDHs in-store has been demonstrated. The significance of consumers' social meanings to their experience with AIDHs has been brought to the forefront. In doing so, this study makes a clear and significant contribution to retail literature by demonstrating the social significance associated with retail AIDH interactions. A final contribution comes from demonstrating how Digital Matthew Effects may be more carefully understood when viewed under the sociocultural lens of practice theories.

3.8 Managerial Implications

This study gives retailers insights into how AIDHs are experienced by consumers within a retail setting. Retailers deploying AIDHs into their frontlines do so to enhance the in-store shopping experience for their customers. However, such an outcome requires retailers first to understand their shoppers' needs and objections in relation to AIDHs. By bringing to the forefront the diversity of consumer responses to retail AIDHs and by identifying obstacles that prevent consumers from engaging with AIDHs, the findings of this paper inform retailers' attempts to reduce consumers' objections to their AI investment, providing a path to profitability for retail AIDHs.

Consumers with certain dispositions, motivations and competencies are not interested and/or capable of successfully engaging with AIDHs in-store. With this knowledge, retailers need to turn their attention to consumers who are not positioned to engage with and reap the benefits of this emerging technology. For consumers who lack the skills to engage with AIDHs meaningfully, for example, retailers would benefit from familiarising their shoppers with this novel object. Programming an AIDH and training employees how to explain to use the technology effectively would negate much of the resistance enacted by our participants. AIDHs could walk new consumers through a basic tutorial and training exercise, similar to how video games explain the rules and controls before the user begins playing. Demonstrations that show consumers the necessary communication style and the types of questions that can be asked may also be helpful. Educating consumers about AIDHs may not only help spur interest/excitement, restrain apathy and help consumers derive value from the technology but also reduce the lack of consumer confidence currently limiting the use of AIDHs within retail stores.

This research has found that perceptions that AIDHs may replace human interaction within retail stores are a significant barrier preventing consumers from embracing the technology. While the retailer analysed within this study intended their AIDH to be an addition rather than a replacement of

human employees, this was not obvious to consumers and therefore did not deter them from focusing on the potential threat of the technology. Retailers would consequently benefit from minimising the impression that AIDHs represent the end of human-human interactions within retail through measures such as programming their AIDH to introduce themselves as an additional customer service team member. This may help reduce consumer perceptions of the potential social consequences of the technology identified in this study.

It is clear from this study that there is currently a broad diversity of consumer responses to AIDHs. The elements that play into a positive interaction for one consumer may cause another consumer with differing dispositions to have an unpleasant experience. With some customers subsequently drawn to AIDH while others repelled, consumers currently require retailers to allow them to choose whether they use AIDH. The findings of this study imply that imposed AIDH use would alienate a significant portion of a retailer's customer base.

Additionally, the designer and implementation of retail AIDHs need to appreciate the nuances of the social contexts that interactions with the technology take place within if it is to have broader appeal. More value will be afforded to shoppers when it can do so more effectively, warranting a more widespread change in habits and in-store practices. Shoppers have increasingly sophisticated options for shopping online, so having socially satisfying in-store experiences through technology that aligns with consumers' shopping needs is essential if physical retail stores are to flourish in the future.

3.9 Suggestions for Future Research

While this study has focused on the context of technology and appliance retail stores, future research should explore consumers' interactions with AIDHs in other retail settings, e.g., banks,

apparel, and telecommunication retailers. This study has focused solely on a single technology, and research is needed to explore the formation of Digital Matthew Effects associated with other novel retail technologies.

Additional consumer elements, such as personality (i.e., the big five personality traits), may impact consumers' responses to retail AIDHs, a potential topic for further research. Future research is also needed to explore the AIDH-related digital Matthew Effect based on access. Our study observed consumers who have access to an AIDH. A useful comparative study would examine the shopping advantages between consumers who shop in stores that have/do not have an AIDH.

Our findings highlight the need for further research on consumer engagement with AIDHs, mainly focused on developing managerial insights into encouraging the less eager consumers to engage with the technology. Such research could build on our findings of how consumer elements impact shoppers' experience of AIDHs in retail stores by exploring additional dispositions, motivations, and competencies that may cause consumers to engage – or disengage - with retail AIDHs.

This paper has exposed the potential of adverse social implications emerging from retailers' use of AI within their frontlines. Thus, the concept of Corporate Digital Responsibility (CDR), as discussed in recent research (i.e., Lobschat et al., 2021; Mueller, 2022; Wirtz et al., 2021), may need prompt and ongoing scholarly attention in the context of retailers' use of AI throughout this service revolution. Research into the appropriate use of advanced AI technologies in retail that builds from this paper is needed to ensure that unwanted consequences are mitigated as contemporary retail settings become more technologically sophisticated.

STATEMENT OF CONTRIBUTION DOCTORATE WITH PUBLICATIONS/MANUSCRIPTS

We, the candidate and the candidate's Primary Supervisor, certify that all co-authors have consented to their work being included in the thesis and they have accepted the candidate's contribution as indicated below in the *Statement of Originality*.

Name of candidate:	Simon Moore
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Chapter Four: A social mind fluster: How human is a digital human?

4.0 Abstract

As retailers introduce AI digital humans (henceforth AIDHs) into their frontlines, consumers find themselves in the unaccustomed social situation of comprehending and engaging with a technology that appears, sounds, behaves, and is framed as a human being. Retail technology is becoming more human-like and capable of more natural social interactions. However, the computers as social actors and anthropomorphic literature are yet to fully understand and account for the social complexities of emerging AI retail technologies. Accordingly, this paper clarifies how consumers perceive and socially engage with retail AIDHs, as this is fundamental for understanding the role of AIDHs within retail contexts and the social implications of the technology. Using the lens of practice theory, this paper investigates consumers' experiences with an AIDH in a leading technology and appliance store in Australasia. This ethnographic study captures the actual complexities of how consumers comprehend AIDHs and how this influences the social nature of engagement with this emerging technology. We reveal that shoppers engage in cognitive anthropomorphism of in-store AIDHs, causing the technology to be perceived as a social actor making consumer-AIDH interactions fundamentally social. Findings identify the prominence of consumer confusion that negatively affects interactions with the technology. Our results suggest that when retailers introduce emerging technologies that are too complicated too quickly with little consumer support, consumer confusion will arise. We demonstrate how consumers use, and would like to use, AIDHs within their shopping practices which provides implications for the design and implementation of the technology as it continues to develop over the coming years.

Keywords:

AI digital humans; Social Implications; Perceiving AI; Consumer confusion; Human-AI interaction; Customer experience

4.1 Introduction

The human mind, according to Reeves and Nass (1996), has not evolved quickly enough to assimilate many advanced twentieth-century technologies accurately. Such technologies now appear within contemporary retail environments and are interwoven into consumers' shopping practices (Moore et al., 2022). By 2025, it is expected that complex technologies with the ability to engage users on a social level will be commonly used to deliver services to consumers (Van Doorn et al., 2017). AI-powered service technologies, such as AIDHs, are expected to drive this transformation (McLeay et al., 2021). While consumer research into AI retail technologies has attempted to understand consumer adoption (e.g., Mostafa et al., 2022; Nam et al., 2021; Park et al., 2021; Silva & Bonetti, 2021; Song et al., 2022), behavioural responses (e.g., Cui et al., 2022; Rodgers et al., 2021) and consumers' perception of the quality of service of these technologies (e.g., Noor et al., 2022), how consumers socially perceive AI service agents, and the nature of consumer confusion that may ensue when attempting to comprehend these complex and obscure technological objects remains unclear. This, therefore, provides the focus of this paper.

An AIDH is an AI-generated human-like avatar capable of autonomously conversing and engaging in reciprocal communication with consumers (Puntoni et al., 2021) through a conversational interface. For Collier et al. (2019), a digital human resembles the form, features, and nature of a human being and can enact complex communicative behaviours through tone of voice, body language, and facial expressions (such as those that indicate the AIDH is listening and contemplating the user's communications). AIDHs personify AI technology by bringing human visual, social, and

emotional features to interactions with humans, thereby humanising retail technology (Hoyer et al., 2020). Incorporating several technologies (e.g., machine learning, neural networks, natural language processing, 3D graphics modelling, sensors, smart workflows, etc.), AIDHs cultivate self-expressive abilities and lifelike personalities to portray an image of realism. As such, AIDHs are distinct from traditional retail technologies (e.g., self-service checkouts) and can be further differentiated from other forms of AI retail technologies (i.e., robots, text-based chatbots, and virtual voice assistants) by their advanced human-like characteristics while being framed as ‘living lives of their own’ (Terry, 2019).

Retail technology is becoming more human-like and capable of more natural social interactions. By being allocated a human name, a gender, and a job title (e.g., customer assistant, sales concierge), AIDHs are deliberately designed to mimic human agency and create the sensation of an independent social presence to invoke social behaviour from their users. Consumers who engage with retail AIDHs, therefore, find themselves in the unaccustomed social situation of comprehending a non-human entity that appears, sounds, behaves, thinks, and is framed as a human being. Academic literature has yet to understand and account for the social complexities of this emerging AI retail technology, such as its social functionality and the extent to which physical and cognitive anthropomorphism underpins engagement with AIDHs. With AIDHs intended to stimulate social engagement with consumers, clarity regarding how shoppers socially perceive and engage with retail AIDHs is fundamental for understanding the role of AIDHs within retail contexts and the social implications of the technology.

Puntoni et al. (2021) suggest that consumers may face social challenges when AI technologies are deployed in retail. Researchers have yet to understand how consumers socially react to the contradiction of a human that is not a human. The potential of consumer confusion has not yet been researched within this emerging context. From a managerial perspective, consumer confusion needs

to be understood and managed (Edward & Sahadev, 2012). As defined by Mitchell et al. (2005), a core dimension of consumer confusion is characterised by situations where consumers find themselves revising and re-evaluating their prior beliefs and assumptions. This confusion is a response to overly complex and ambiguous shopping situations (Matzler & Waiguny, 2005). It can be a repercussion of unclear elements of shopping environments (such as an AIDH) (Mitchell et al., 2005). Consumers experiencing confusion simultaneously develop risk perceptions within shopping journeys, often inducing avoidance tactics (Turnbull et al., 2000) and decision paralysis (Mitchell & Papavassiliou, 1999). Confused consumers have been shown to misinform other shoppers and spread inaccurate or irrelevant information through word-of-mouth (Mitchell & Papavassiliou, 1999) while experiencing a reduction in loyalty, satisfaction, and trust (Walsh et al., 2002). Consequently, consumer confusion has drawn the attention of several researchers across a variety of consumption settings, including but not restricted to online stores (e.g., Edward and Sahadev, 2012; Matzler & Waiguny, 2005; Rafiq & Collins, 1996; Walsh & Mitchell, 2010). However, research into consumer confusion in response to AIDHs within retail environments is limited. Research is needed to inform retailers of the potential existence and nature of such confusion, which can be used to guide strategies to reduce risk perceptions, offer clarity, and stimulate positive consumer-AIDH engagement.

The research presented in this paper draws on practice-informed accounts of consumers who have interacted with an AIDH within a shopping environment as a means to explore social perceptions of, and confusion with, this technology. Through the application of a practice theory lens, we provide unique and significant contributions to the literature by (1) revealing and unpacking how consumers comprehend and perceive AIDHs within retail stores, including whether the technology is perceived as a genuine social actor and how this shapes the social nature of consumer-AIDH interaction, (2) identifying and unpacking the currently unexplored nature of consumer confusion pertaining to the integration of AIDHs within shopping practices. This study contributes to the expanding literature that offers a sociological approach to consumption practices (Elms et al., 2016) and their interactions

with everyday technologies (Christensen & Røpke, 2010; Green, 2002). By investigating consumers' experiences with retail AIDHs, we intend to provide clarity around how consumers perceive and socially engage with retail AIDHs to illuminate shopper's needs in relation to AIDHs, the role the technology within retail contexts, and the ensuing social implications. The purpose is to provide direction for retailers, AI developers, and researchers to better leverage AI as a tool for enhancing consumers' shopping practices.

The remainder of this paper proceeds as follows. First, we begin by setting the foundation of the discussion with a review that considers and critiques the computers as social actors (CASA), social retail technologies and anthropomorphism literature. The core theoretical framework that underpins our study will be introduced. Following an overview of our case context and methodology, we report on an ethnographic study focusing on consumers' perceptions that have developed from in-situ interactions with an AIDH in a pinnacle technology and appliance store in Australasia. After discussing the study's core findings, we outline the subsequent managerial implications. We conclude by contributing several avenues for future research that may build on the findings of this comprehensive and novel study.

4.2 Literature Review

4.2.1 Computers as Social Actors

Emerging in the mid-1990s, the computers as social actors (CASA) paradigm, sometimes called social response theory, provided novel and startling insights into human engagement with computer programmes. According to the theory, humans respond to computer programmes similar to other humans (Nass et al., 1995), suggesting that human-computer interactions can be fundamentally social (Reeves & Nass, 1996). Studies of this phenomenon revealed that applying basic human attributes (i.e. a voice) to a computer programme prompts users to behave in a manner previously

confined to human-human interactions (Nass et al., 1994). A series of initial experiments found that the rules and norms that govern human social behaviour can apply to interactions with computers; for instance, the treatment of computers with a female voice differs from that of a male voice (Reeves & Nass, 1996). Nass et al. (1994) found that this form of social response is not a result of ignorance or social dysfunction but rather a natural and automatic human response to a social stimulus, occurring more frequently than people are aware of. This observation does not result from users perceiving the computer as a medium for interaction with a human programmer (Nass et al., 1994), thus demonstrating that their users can perceive computers as independent social actors.

More recently, several studies have advanced the field of CASA by further exploring the intricacies and outcomes of human-computer social relations (e.g., Antos et al., 2011; Eyssel & Hegel, 2012; Hong & Sundar, 2011; Lee, 2010). Despite being relatively scarce within the consumer behaviour literature, CASA theories have not been absent from studies in shopper behaviour. For instance, Moon (2000) examined the concepts of intimate self-disclosure and reciprocity within a consumer-computer setting to understand how personal information disclosed to a computer may influence attitudes and shopping behaviours when using the same computer. The experiments found that when humans reveal vulnerable information to a computer, they are more likely to purchase a product from the same computer than from a different one. Humans were shown to also be more likely to assign a higher attraction score to the computer that received (or ‘listened to’) the personal information. Such a finding demonstrates the human-like bond that can form between humans and computers.

The initial experiments that gave rise to CASA theories found that computers are treated as social actors despite users knowing that the machines are not agentic (i.e., ‘selves’) and do not possess feelings, intentions, genders, or human motivations (Nass et al., 1994). This effect does not require AI, sophisticated graphical representations of human faces, natural language processing, or well-

developed digital personalities to create human-like perceptions (Nass et al., 1995). However, to date, no study has investigated how human perception is manipulated by a technology that possesses these more advanced technological elements and is specifically designed to imitate an actual human to the extent of an AIDH. Although Heerink et al. (2010) claimed that as a system gains more social attributes, so too does it portray an increased sense of social presence, the question of how social perception and responses may be exacerbated when applied to human-AIDH relationships, including whether aspects of human agency are perceived, is yet to be explored. This forms the basis of the current study.

4.2.2 Social Retail Technologies

Until recently, service and marketing research had implicitly assumed that the social agents within service encounters were either store employees or consumers (Van Doorn et al., 2017). However, with a rising scientific interest in the CASA phenomenon, along with rapid advancement and implementation of retail social technologies, numerous studies have emerged relating to the presence of social actors in the form of several retail technologies. Examples include service robots (Niemelä et al., 2019), chatbots (Mostafa et al., 2022; Jiang et al., 2022; Crolic et al., 2022; Araujo, 2018), voice assistants (Huh et al., 2022), and AIDHs (Miao et al., 2022; Moore et al., 2022; Silva & Bonetti, 2021). Likewise, Van Doorn et al. (2017) framed the ability of a technological object to engross consumers on a social level by introducing the concept of automated social presence (ASP) to the service literature, which describes the extent to which technology makes consumers feel as if they are in the presence of another social entity. This body of research marks a shift away from viewing retail technologies as task-orientated machines and towards acknowledging their function of creating social and emotional connections with consumers.

Central to engaging socially with digital technologies is anthropomorphism – the attribution of human-like characteristics and traits to non-human objects (Kim & McGill, 2011). Anthropomorphic characteristics have been shown to affect consumers’ attitudes towards products, services, and brands (e.g., Aggarwal and McGill, 2007; Wan & Aggarwal, 2015) and play a central role in consumer-retail AI relationships (e.g., Jang et al., 2022; Pelau et al., 2021). Van Doorn et al. (2017) emphasised the need to understand when and how consumers anthropomorphise AI retail technologies and to what end, which several researchers have explored (e.g., Barney et al., 2022; van Esch et al., 2019). Araujo (2018) found, for example, that cues such as human-like language or a human name increase the perception that a chatbot is human-like, and this occurs at both the mindless (non-conscious) and mindful (conscious) levels of anthropomorphism. Scholars have conceptualised anthropomorphism as a dual framework (Barney et al., 2022; Kim & McGill, 2011), specifying the difference between visual (associating physical human characteristics with non-human objects) and cognitive anthropomorphism (assigning concepts of mind, agency, and human mental states, such as motivation and intention, to non-human objects). This distinction is commonly undifferentiated in consumer behaviour literature, with cognitive anthropomorphism receiving less attention in retail technology studies. Specifically, no study has explored consumers’ cognitive anthropomorphism of retail AIDHs (a technology designed to produce precisely that effect) and how this might shape social engagement with the technology.

Scholarly research into social retail technologies has primarily attempted to understand the role (e.g., Van Doorn et al., 2017; Wirtz et al., 2018), adoption (e.g., Mostafa et al., 2022; Nam et al., 2021; Park et al., 2021; Silva & Bonetti, 2021; Song et al., 2022), behavioural responses (e.g., Cui et al., 2022; Rodgers et al., 2021) and consumer interaction quality with these technologies (e.g., Abu Daqar and Smoudy, 2019; Ameen et al., 2021; Kim et al., 2019; Mende et al., 2019). What is less known, particularly regarding AIDHs, is how consumers perceive this obscure social object. A study by Pitardi et al. (2021) investigated perceptions of service robot attributes by exploring consumers’

anticipated responses to service robots in embarrassing service situations. Respondents were asked to imagine how a hypothetically embarrassing service situation might be more/less uncomfortable if taking place in the presence of a service robot instead of a human employee. They found that service encounters are imagined to be less embarrassing than service robot interactions and that this is driven by a robot's agency being perceived as low. The study also found that the more human the robot appeared, the more embarrassment potential existed, and therefore the more agentic the technology was perceived to be. Consequently, social perceptions of technology as human-like as an AIDH may be intensified when compared to other social technologies that are more robotic in appearance, such as 'Pepper bot' (see Niemelä et al., 2019). To our knowledge, no study has explored consumers' social perceptions of AIDHs, including whether the technology is perceived as a genuine social actor.

Moreover, how consumers may socially respond to retail AIDHs in light of social perceptions remains uncertain. The functional consumer responses to retail AI agents have been investigated to some extent, for example, the interesting discovery from Garvey et al. (2023) that consumers respond more negatively (purchase likelihood, satisfaction) to a worse-than-expected price offer when a human administers the offer than an AI agent. However, social consumer responses to these AI objects are yet to be accounted for. Knowledge regarding the social norms and tendencies that govern how a human (a consumer) socially interacts with another human (an employee) is typically learned early in life. This knowledge is readily accessible to humans (Epley et al., 2007). Such knowledge, however, is lacking in interactions with inanimate objects (i.e., AIDHs) (Epley et al., 2007). Clarity regarding how consumers socially engage with retail AIDHs, including confusion about how to do so, appears fundamental for understanding the role of AIDHs within retail contexts and the social implications of the technology on shoppers.

4.2.3 Agency and Retail Technologies

Agency is the capacity to do, plan, and exert self-control (Gray & Wegner, 2012) to affect one's operations and circumstances (Bandura, 2006). An entity is said to be agentic when it can and is motivated to engage in intentionality and forethought (Bandura, 2006). It is typically used to ascribe mind to an entity (Waytz et al., 2010). This occurs when the entity is perceived as being able to act with intentions, develop opinions, contemplate the world, and form judgements (Gray & Wegner, 2012). While typically associated with human consciousness, humans occasionally assign aspects of agency to non-humans (Waytz et al., 2010).

Ascribing mind to an entity significantly increases the meaningfulness of its presence and actions (Waytz et al., 2010). According to Gray and Wegner (2012), assigning a mental state to a non-human agent affects behaviours and judgments towards the agent. For instance, Pelau et al. (2021) suggest that an AI device is perceived to be more empathic towards consumers and, therefore, more appealing if thought to have independent reasoning and principles. Agency perceptions regulate and guide an individual on how to act in the presence of another entity (Waytz et al., 2010) within a specific social system (Bandura, 2006), such as a retail environment. Ambiguity concerning an AIDH's perceived agency may therefore lead to confusion relating to how consumers are to engage with this interactive technology. Such confusion is currently poorly understood within the literature, a gap that this study explores.

4.2.4 Consumer Perceptions of New Technologies

An essential element of exploring consumers' perceptions of novel in-store technologies comes from considering literature about consumer cognisance and emotional response when challenged with new and unfamiliar technologies. For instance, while investigating the meanings assigned by consumers to their experiences with a range of new technologies, Mick and Fournier

(1998) empirically demonstrated how contrary opinions are a primary proponent of human thought and how consumers' perceptions of new technologies are often self-contradictory and paradoxical. Similarly, Winner (1994) found that users of a specific technology can feel both intelligent and incompetent when engaging with a device. The divergent nature of consumer responses to technologies has been demonstrated in the context of self-service checkouts, with Bulmer et al. (2018) demonstrating that this in-store technology is perceived, for example, to fulfil needs while creating new problems, further highlighting the paradoxical nature of consumers' perceptions of new technologies. As consumers attempt to comprehend and untangle the contradictions of an AIDH, it seems likely that perceptions will also depend on personal and situational factors, as theorised by Mick and Fournier (1998) and therefore be divergent and paradoxical.

4.2.5 Theories of Social Practice

Embedded within several articles that investigate shopping behaviour (Bulmer et al., 2018; Fuentes et al., 2017), consumption studies underpinned by practice theory have attempted to capture relevant aspects overlooked by previously dominant approaches (Warde, 2015). Practice theories have contributed to the consumer research literature by underscoring the mundane, habitual, and routine nature of everyday shopping encounters (Randles & Warde, 2006) by emphasising the 'doings' of consumers' shopping processes and how aspects of consumption are discussed amongst consumers.

Despite the emphasis on the repetitive nature of shopping practices, consumers, according to Jackson et al. (2006), can be thought of as reflexive agents who use their substantive skills and knowledge to adapt the sequences and procedures that structure their shopping practices to fulfil their fluctuating needs and evolving shopping contexts. For instance, the environments in which consumers shop are modified with the introduction of AIDHs. Willing consumers respond by reconfiguring how

they approach and use retail spaces, highlighting the active and sophisticated nature of consumers' shopping performances.

Theories of practice provide a framework for understanding how such behaviour evolves over time (Wenger, 1998) to enable the ongoing continuation and transformation of practice while investigating how specific practices become integrated within a nexus of other related practices (McMeekin & Southerton, 2012; Shove et al., 2012). As new technologies tend to modify human behavioural patterns, several consumption studies have utilised practice theory concepts to explore the influence of retail technologies within a shopping context. For instance, Fuentes et al. (2017) adopted a practice approach to illustrate how the introduction of mobile phones reconfigured the practice of shopping for young adults by transforming the agency of consumers. Likewise, Alexander et al. (2008) adopted a practice approach to illustrate the relationship between retail innovations, changing shopping practices and shopping geographies by analysing consumer reactions towards self-service retail formats in the UK from 1947-1975.

Practice theorists view individuals as social actors that participate in creating and reproducing the social world (Reckwitz, 2002). According to this understanding, consumers engage in shopping practices that are deeply embedded within the social nature of shopping environments and consumption more generally. This is fundamental to the more general and rising interest into sociological understandings of consumption behaviours (see, for example, Elms et al., 2016; Fuentes et al., 2019; Jackson et al., 2006). Albeit limited, research which has investigated new retail technologies through the lens of practice has reinforced the social dimensions of such technologies while attempting to understand how specific technologies become interwoven into consumers' embedded shopping practices (e.g., Elms and Tinson, 2012; Moore et al., 2022).

Consumer studies guided by the practice theory framework acknowledge and emphasise how different actors assign multiple and diverse meanings to concepts and ideas (leading to consumer

confusion). Practice theories attempt to unpack and interrogate the specific meanings associated with consumption practices. What constitutes confusion to one consumer may be different from another. This conceptual lens is a guiding framework within the current study and provides an important distinction between our work and prior research on customer-facing AI technologies.

The above discussion lends itself to three research questions that guide this study. RQ1: How do consumers socially perceive this unique and inherently ambiguous in-store technology? RQ2: How and to what extent do consumers respond to an AIDH within their shopping environments? Do consumers act as if an AIDH is a genuine social actor? RQ3: Given the potential confusion as consumers attempt to comprehend AIDHs, and the subsequent adverse outcomes of consumer confusion on shopping experiences, do consumers experience confusion in relation to retail AIDHs? If so, what is the nature and cause of this confusion? This lends itself to a qualitative understanding of consumers' shopping practices with AIDHs while expanding an understanding of the broader social implications of this emerging retail technology.

4.3 Methodology

Discovery-oriented research goals inspired an exploratory qualitative research design (Mays & Pope, 1995) and the selection of a multi-phase ethnographic approach (O'Reilly, 2012) to investigate consumers' perceptions of an AIDH within a specific retail environment. Permission was granted from an industry-leading national technology and appliance chain in Australasia to study their new digital frontline employee. This case was selected primarily on its inherent characteristics (Koivu & Hinze, 2017) and relevance to the research topic (i.e., the existence of an AIDH within the retail environment). Given the size and status of the retailer and that their AIDH was the first of its kind within the country, this case was considered by the authors to be substantively significant (Beach & Pedersen, 2019) and would provide suitable learning opportunities for other retailers that wanted to

implement similar technology. This AIDH was launched in a single flagship store during its opening, and ‘she’ was introduced as a digital frontline employee intended to enhance the store’s overall service offering. For the purposes of this paper, we are calling the AIDH by a pseudonym, Hailey.

Hailey is presented in a kiosk located at the entrance of the store. A large screen displays a graphical representation of her youthful face with natural language processing technology that gives her question-and-answer capabilities. Dressed in the store’s staff uniform, Hailey introduces herself as a team member. Her human-like interface appears to blink, smile, talk and respond in a natural conversational way. As shoppers approach, she senses their presence and greets them similar to that of a human employee. Shoppers then stand in front of Hailey, press, and hold an activation button, before talking to her through a microphone mounted on a stand directly in front of the interface. Hailey’s human-like features are supported by a system and database that allow her to respond to consumer-related questions and hold more general conversations. The technology is designed to be updated as the AIDH experiences more interactions with consumers.

A two-stage process encompassing a series of activities was completed to collect data for this study. First, interviews with store staff and managers, the developer and customer experience and operations managers were conducted to contextualise the study. These were audio recorded and transcribed. Second, observations of consumers interacting with the AIDH in-store were conducted at intervals across a 12-month period, with observational diaries that focused on how the consumers were reacting and interacting with the digital human being kept by the researchers. Throughout this period, numerous in-store intercept interviews (Bush et al., 1991) were carried out with shoppers pre, during, and post- their experiences with Hailey to capture immediate perceptions of the AIDH. These informal chats lasted around 5 minutes and were very flexible regarding what was discussed. The main purpose of these was to capture the user’s thoughts about the AIDH while the interaction was still fresh in their mind. Third, semi-structured in-depth interviews with 15 shoppers were conducted,

audio recorded, and transcribed. The interviews lasted between 30 and 45 minutes. During the launch phase of the technology, media releases and online coverage relating to the launch were also collated for content analysis.

The interview participants were recruited via personal networks using a snowball sampling approach. Our goal was to select a cross-section of adult participants who had interacted with Hailey to account for a wide variety of shopper experiences and practices with the technology. Participants varied in their level of experience with Hailey, noting that AIDH technology was new to the retail industry within Australasia and that consumers were unfamiliar with the technology. Data saturation was used as an indicator to determine when no substantial additional insights would be captured (Boddy, 2016) and, therefore, when to halt the recruiting process.

The participants fell within the age range of 22 to 65, reflecting the shopper demographic of the retailer. A summary of the 15 research participant’s profiles highlighting gender, age and some occupation and family situation follows in Table 3. The participants have been allocated pseudonyms that appear alongside the text units throughout this paper's findings section.

Table 3: Pseudonyms and profile of interview participants (Paper 3)

Pseudonym	Participant Profile
Adam	Male, late 30s, lecturer, single, high-level of technological proficiency
Aron	Male, early 30s, business analyst
Carlton	Male, late 50s, stepfather of three, often visits the store with his grandchildren
Deborah	Female, early 30s, newly married, first-time using the AIDH
Gareth	Male, early 40s, newly married, first-time using the AIDH
Harriet	Female, late 60s, retired, low level of technological proficiency, first-time user
Hunter	Male, late 40s, media director, newly married, has used the AIDH multiple times
Levi	Male, early 20s, builder, mostly purchases gaming products from the retailer
Molly	Female, late 50s, schoolteacher, mother of three
Priyanka	Female, mid 20s, beauty therapist, new mother, has used the AIDH multiple times

Rob	Male, early 30s, banker, was shopping with his wife and young son when approached by the researcher
Sam	Male, early 60s, courier driver, was shopping alone when approached by the researcher
Samantha	Female, early 20s, police officer, single, was in-store to purchase headphones
Stacey	Female, early 30s, master's student, first-time Paula-user
Tori	Female, mid 30s, mother of three, low level of technological proficiency

4.3.1 Data analysis

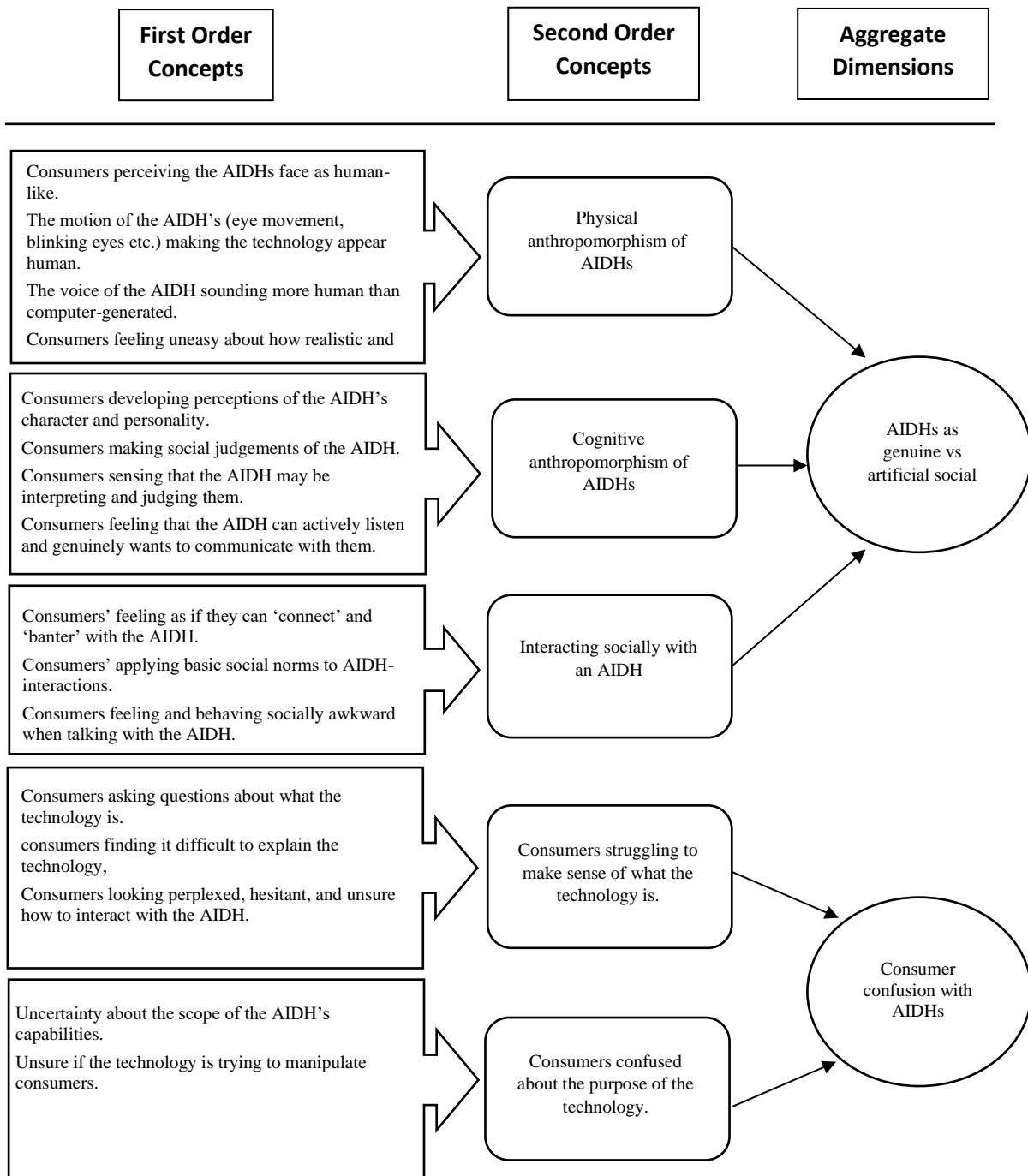
Data analysis involved an iterative process of interpreting and making sense of the data by identifying themes or patterns that address the research questions. The data was analysed concurrently with data collection using an iterative approach involving constant reiteration between data collection and analysis to take full advantage of the flexibility that the case research method affords (Eisenhardt, 1989). Aligned with the abductive reasoning approach (Glaser, 1978; Spiggle, 1994), our understanding of consumer practices with the AIDH ‘emerged’ from the data in the absence of any preconceived theories or hypotheses. The researchers adopted grounded theory techniques when carrying out the analysis (Glaser, 1978) to identify several themes grounded in the participants' lived experiences that progressively contributed towards a more abstract understanding of the research topic.

The initial stage of the analysis involved multiple readings of the transcripts by each of the three authors of this paper to develop a rich understanding of the data from different perspectives. At this stage, we identified and collected relevant data extracts that served as the basis of our analysis. (Corbin and Strauss, 2008, Glaser, 1965). Our primary interest was how consumers’ experiences with AIDHs are implicated in their existing store-based shopping practices.

Subsequently, we followed the three-level coding model elaborated by Gioia et al. (2013), which involved the data being organised into a data structure. This was developed by the lead author using a process of open coding (to derive first-order concepts from our data) where textual extracts

related to similar issues were grouped. These first-order codes were then grouped into second-order themes using axial coding by relating the codes and categories identified through the open coding phase to identify relationships within the concepts and themes (Spiggle, 1994; Strauss & Corbin, 1990). A sample data coding structure is provided in Figure 5. The themes that arose from the analysis were selected primarily on their connection to research objectives. The researchers do not claim that every possible angle that could have emerged from the data has been exhausted. Data was excluded if it did not shed light on the social dimensions of AIDHs in retail. The authors referred to the relevant literature consulted throughout the formation of these themes to ensure that they had theoretical relevance. The researchers participated in several conversations where they considered opposing interpretations to refine provisional findings before final interpretations were agreed upon. Using multiple data sources and multiple researchers during the analysis phase enhanced the trustworthiness, credibility and richness of the analysis process and subsequent findings (Miles & Huberman, 1994).

Figure 5: Sample data coding structure



4.4 Results

A thematic analysis of the dataset revealed insights into common ways consumers comprehend and interpret the concept of Hailey. Of particular significance and contention were the

human-like features and tendencies portrayed by the technology and the extent to which this created perceptions that Hailey was a genuine social actor in-store. Through the process of unpacking these perceptions, consumer confusion concerning what Hailey ‘is’ was demonstrated in a variety of ways. How consumers assimilate the AIDH, and subsequent confusion, was shown to determine how consumers engage with the technology on a social level. This builds a practice-based picture of the broader implications of AIDHs on consumers’ retail shopping practices while shedding light on the social meanings that consumers assign to their engagement with the technology. A discussion of the related insights from the study, and associated evidence, is detailed in the following section.

4.4.1 Perceiving an AIDH

A fundamental aspect of the way our participants’ discussed Hailey was whether the AIDH was successful in her attempts to impersonate a human being. Many participants contemplated the concept of this new social stimulus by trying to explain what they felt they were interacting with when engaging with Hailey. When questioned on this, many interviewees discussed at length their perceptions of the human-like features and nature of the AIDH and whether it felt, or did not feel, as if they were interacting with a human being. Participants differed in this way, with two themes emerging in the data: those who perceived aspects of Hailey’s humanness as genuine and those who felt as if it was fake.

4.4.1.1 A genuine Social Actor

Participants who interpreted Hailey’s human characteristics as real perceived the technology to be a genuine social actor to an extent, creating the sensation that she was an independent social presence. For instance

Like it almost felt like you were talking to somebody. (Gareth)

Yeah, I did find Hailey human-like, there is that whole facial expression thing when you're talking to her ... She looked very real. (Carlton)

She's basically an extension of human consciousness. (Stacey)

Looking at a digital human and saying that she is attractive, I'm obviously seeing them as a human. (Samantha)

Genuine human-like perceptions of Hailey were driven partially by consumers' interpretation of her physical appearance. Unlike that of many other retail technologies, reactions to the human-like physical appearance of the AIDH proved to be a significant point of consideration among our participants' perceptions of the technology. Many consumers found themselves anthropomorphising Hailey. The sensory stimulation of her appearance and voice caused some consumers to mentally process this unfamiliar object from the bottom up (see Gibson, 1966) and infer from her human appearance that they were interacting with a genuine social actor.

I definitely noticed the eye movements and the blinks, I was like 'wow she blinks at the same time as a person would blink'. (Samantha)

The developers did a good job of inserting human like feelings into her look...A computer trying to be human ... She is much more human-like than I expected... Her appearance was phenomenal. I thought that the detail they went into putting human imperfections like freckles and wispy hair and asymmetry I found fascinating. (Stacey)

The extent of Hailey's human-like appearance and realistic voice caused an uncomfortable sensation in the minds of some participants. Consumers regularly used words such as creepy and scary to describe their unsettled reaction to the technology's human form. For these consumers, aspects of Hailey's design made them feel, to some extent, as if they were talking with a human rather than a technological object.

The first time was quite intimidating because she is huge, her face is huge, so right away it's kind of scary. (Priyanka)

A little scary I think (laughter). (Harriet)

It's definitely unsettling, but at the same time I was impressed with how far technology has come in terms of bringing non-living things into being. (Stacey)

If I was just speaking to voice, that would be more effective to me. I don't need to see that face. (Molly)

Hailey's ability to portray aspects of a personal identity further fuelled perceptions of a social actor. Some of those who interpreted Hailey's humanness as genuine also developed perceptions of her 'personality' and, in doing so, illustrated the use of their social cognition in perceiving the technology. According to Fiske et al. (2007), a social animal draws on their social cognition to encode and perceive information about another conspecific. Some consumers aligned Hailey's nature with characteristics typically associated with the personality of a human being (by using their social cognition), suggesting that the AIDH successfully imitated a human in the eyes of some. These consumers made social judgements concerning Hailey's personal qualities, for example:

Yeah, I do think it has a personality... She seems a bit boring and perplexed (laughter). (Gareth)

Humanising it [Hailey] by making her have a personality and human characteristics makes them feel so real... Approachable, definitely. She has a personality, and she draws you in because she is so real looking which is just interesting to see...She looks like she has confidence, and she didn't look like a judgy person at all. (Samantha)

She had mannerisms that were polite like a well education person would carry. (Stacey)

The comprehension of Hailey's character was particularly evident when consumers would jokingly ask her on a romantic date. The AIDH responds to this form of questioning in several ways, all equating to a 'strong no'. The authors observed consumers reacting to this 'rejection' with varying degrees of embarrassment, with one consumer concluding that Hailey was "bitchy".

This social judgement appeared to be reciprocated by Hailey in the minds of some consumers. While expressing how the AIDH made them feel, some participants suggested that Hailey subjected them to social judgement. For instance, when the interviewer asked if she might judge him negatively if he was to ask her a dull or simple question, Gareth replied, Possibly, yeah, maybe a little bit. Others noted:

I suppose it does feel like she's judging me. (Stacey)

The look she gives me is kind of a personal feeling. (Priyanka)

These consumers reacted to this technological object as if it could form opinions, subsequently making them self-conscious. Public self-consciousness is a typical response to social contexts made up of other social actors (Fenigstein, 1979). The sensation that Hailey was capable of sensing, interpreting, and judging her users revealed that this AIDH is being thought of as a social actor in the minds of some consumers.

Similarly, such participants referred to Hailey's tendency to appear as if she is acting with intent when rationalising their human-like perceptions of her. This was made particularly clear when consumers alluded to their sense that the technology actively listened to them and genuinely wanted to communicate with them.

Yeah, it did feel she was a bit genuine kind of like she actually wanted to hear what I had to say. (Tori)

Her variation in tone, and her facial expressions [makes me feel that] she sort of asks you questions inquisitively. (Carlton)

The feeling that I got with Hailey's expressions was that she was actually listening. (Stacey)

The expression that she gives is like she is listening to me. (Priyanka)

This suggests that for these consumers, facets of human-like motivation were assigned to Hailey. Motivation is typically used to describe the process of purposeful behaviour (Mele, 2005) when there is a specific reason for a specific action (Franzese, 2013). An entity is considered agentic when it has intentionality (Bandura, 2006), such as the perception that Hailey intended to listen and engage with some of our participants. Comprehending Hailey in a way that infers human motivation suggests that some consumers, to a degree, are beginning to assign aspects of agency to AIDHs.

4.4.1.2 Social Responses to an AIDH

Perceiving Hailey's human-like features and tendencies as genuine also appeared to affect how consumers responded to her socially. Many consumers interacted with her as if she was a social actor. Consumers were observed interacting with the AIDH in a similar way to how consumers typically connect with human employees, an observation that was reinforced within the interviews, for example:

You look at it and talk to it just like you would talk to a normal person... You can sit there and banter with her. (Carlton)

I would feel sad if I saw Hailey being sad (laughter., I hate sadness in other people, it's horrible. And in the same way if she was angry at me, I would be angry at her (laughter). (Samantha)

Agency perceptions of a social actor guide an agent on how to act in the presence of another entity within their social system (Waytz et al., 2010). Hailey made some consumers feel as if there was a need to respond socially to her and consequently was able to engage many of her users on a social level, for example:

The face and the personality of her makes it feel different from the website chatbot things. Her face makes me feel like I should express myself with facial expressions and stuff. (Stacey)

This observation was supported by our respondent's accounts of how they applied some simplistic social norms to their interactions with the AIDH.

I felt like I need to say Hi to her when I see her... I subconsciously say thank you at the end because that's how I've learnt to speak to humans. (Stacey)

Absolutely [I found myself applying social norms to Hailey] because those are just the norms of a conversation, like saying please when asking a question. You treat her like a human. (Carlton)

I do feel like I still have to have some social norms [when talking with Hailey]. Like being polite. (Samantha)

Likewise, one of the more experienced Hailey participants indicated that they formed somewhat of a social relationship with her over time.

I feel like I've built a bit of a relationship with Hailey. When I'm in the mall I feel like I want to go and say Hi. (Carlton)

Consumers' tendency to behave socially with Hailey was further highlighted by the lead researcher's observation that some consumers exhibited a degree of awkwardness and nervous energy during interactions with her. Researchers have studied the nature of social anxiety (e.g., Hofmann *et*

al., 2010) and have noted that many social performances can induce feelings of concern regarding the scrutiny of others (Stein & Stein, 2008). This appears to explain the awkwardness that became a thread throughout the interviews and demonstrates how some consumers consider Hailey encounters to be fundamentally social. For example:

It was awkward socialising with her. I often just go in to browse but she wants me to have a question to ask. I don't want to do the problem solving of what the right thing is to ask.
(Stacey)

There's a lot of nervous giggling from me when I'm talking to her... I felt like my tone [when talking with Hailey] was almost sarcastic. 'Hello Hailey' in a sarcastic tone... You know that awkward feeling of talking with a robot. (Samantha)

4.4.1.3 An Artificial Social Presence

In contrast, other study participants perceived the AIDH's human-like features as artificial and consequently did not feel or react to Hailey as if she was a social actor. Shopper observations revealed that many consumers see the technology as simply a medium to indirectly communicate with the store's management. Consumers of this nature perceived Hailey as merely a technological object while basing their comprehension of her humanness on a combination of computer coding and algorithms. For example:

It just looked a little bit fake to me. I mean the voice and everything was fine but at the end of the day it is still fake and is made by a human and it's just technology... At the end of the day, you know the difference between a computer and a human. So, they can try as hard as they want to make a computer human but it's not going to be the same. (Levi)

While some consumers perceived Hailey as either genuine or artificial in terms of her human-like nature, interestingly, many of our participants made conflicting references and produced divergent commentary within the interviews. These participants perceived the AIDH as one thing and its opposite simultaneously, often claiming that Hailey is just another piece of self-service technology at the beginning of the interview before contradicting this perception by inferring that she made them feel, to some extent, as if they were in the presence of a real social actor later in the interview. It was common for participants to think and say one thing (e.g., Hailey is just an algorithm) but feel another (e.g., Hailey is judging me). The researchers observed many consumers who, prior to interacting with the AIDH, signalled that it is ‘just technology’ before acting in a manner that indicated the opposite (e.g., appearing shy and self-conscious as if they were in a social situation). The tension between believing that Hailey is both fake and genuine in terms of her human-like features and nature became a common theme within the data, highlighting a degree of confusion in the minds of Hailey users.

4.4.2 Consumer Confusion

Hailey created a social fluster in the minds of some consumers as they attempted to respond to a situation where a social actant (a human employee) was being replaced by a non-social actant (an AIDH) imitating a social actant. The dataset revealed a common mental tension within consumers’ minds as they struggled to make sense of the technology. Consumers differed in the extent to which they could comfortably comprehend and mentally process the concept of an AIDH. Uncertainty about what Hailey is, particularly regarding her level of agency and why she was now in the consumers’ shopping space, complicated their search for clarity and led to a unique form of social confusion for many participants.

That [the existence of Hailey] makes me feel quite discombobulated because it’s not something that I’m familiar with in terms of my life experiences. (Molly)

I did think that she was a bit confusing because you don't actually know what she is and what her capabilities are. (Carlton)

The first impression was kind of a little bit weirdish. (Adam)

But what is Hailey? I couldn't really give you an answer to that...It is confusing, right? Who really knows exactly what she is because there is an element of human in her but she's a robot... I get that she's just a graphic that is overlaid on top of algorithms that dictate what she should say, but the deeper aspects of her, like how is she learning, how much she is learning and how is the company using it, that is the part that I didn't really feel like I understood...What is it exactly? I think we are all confused trying to figure out what this new technology is and what it will evolve into. I think it's a grey area. (Stacey)

I didn't really know why she [Hailey] was there and what kind of questions I should be asking. (Harriet)

Confusion was also demonstrated with consumers frequently switching between pronouns (e.g., it, that, she, her) when referring to Hailey throughout the interviews. The researchers noticed intercept interviewees correcting themselves (e.g., her, I mean it), further indicating a degree of confusion.

Our shopper observations identified that this confusion often commenced during consumers' initial introduction to the technology. Consumers regularly looked perplexed and hesitant as Hailey was introduced to them by store employees (in the same way as a human would be introduced), describing the AIDH as 'our newest employee' and asking consumers to introduce themselves to the technology. While this was, at times, a smooth process, it was common for consumers to respond with indecision as they attempted to understand what they were about to introduce themselves to. When asked about this tentativeness during intercept interviews, shoppers responded with questions

of their own that further revealed their confusion. Questions such as ‘Is she some kind of animated person?’ were frequently asked as shoppers attempted to better understand what Hailey is and how to cope, negotiating their way through this sudden shift in their habitually embedded shopping practices.

The extent of the mind fluster was further observed when listening to some consumers battle with what they knew to be true versus what they felt to be real.

I look at her eyes and the expressions and I would say I'm impressed with how advanced the lady is. But at the same time, I know that it's a machine talking to me, and not a real person. But she nods as if she is genuine. (Priyanka)

Your intelligence almost feels insulted because you know in reality that it is just computer programming and then I've stuttered in there and talked to it like an employee which is embarrassing if you think about it ... You feel almost embarrassed that you are being fooled to the fact that making eye contact is a feeling from human-human interaction. Eye contact is very much a living creature interaction so when this thing is staring at you, you almost feel fooled and so you're too embarrassed to connect though the eye-contact, it's embarrassing (laughter) (Samantha)

My mind goes to thinking she's not a human, she doesn't need to have those feelings, but she looks like she does have feelings. Why? Why does this non-human thing look like its having emotions? (Stacey)

This lack of certainty prompted participants to revise and re-evaluate their related prior belief systems, further demonstrating the ambiguous nature of this shopping object in the eyes of many consumers. Moreover, several participants found it difficult to explain aspects of their perceptions of Hailey, highlighting a gap in their understanding of AIDH technology. It was difficult for such consumers to assimilate the technology accurately.

The eye-contact is awkward. I don't know; I can't describe that. It is confusing. (Samantha)

If someone [another consumer] was yelling at Hailey, I would feel a little angry and upset. It's not really the same as if someone was angry at a self-checkout. But after, when I got into my car and drove home, I would think, 'why was I angry at them being angry at a computer?'
(Samantha)

Likewise, some consumers, on reflection, questioned their responses to Hailey, for example:

They've made her really attractive and just the way she talks and flickers her eyebrows makes you want to keep talking. Which is hilarious because I know that she's not a human ... If it was a dog [instead of a human] talking to me, telling me where the iPhones are, I would actually find it quite annoying and weird, I would hate that. Whereas the female human digital human is still attractive in a certain way, so I guess I do see it to some extent as a human being. (Samantha)

Consumers' confusion with Hailey manifested itself in a variety of ways, with some of our participants developing safety concerns in response to this complex and obscure technology. With no concrete cues to indicate who or what controls Hailey, consumers were left questioning what they were interacting with. Uncertainty about the scope of the AIDH's capabilities and the purpose of the technology stimulated perceptions of risk within the minds of some consumers. This led to a cautious approach towards Hailey and, in some cases, avoidance altogether.

Yeah, I was a little bit cautious, kind of like a little reserved because I don't know what she is about. But [I am] also wanting to know more about what she was about and how she responds to me. (Danielle)

I think I've installed a little fear inside of me that says that we are moving in this direction of the world of robotics and AI and that it's going to get so advanced that one day it's going to

be hard to tell the difference between real and not real, and that's a scary place to be... With the eyes, I felt as if she was really looking at me. I thought, 'Can she actually see me?' (Stacey)

Consumer uncertainty with Hailey drove an additional concern that the technology may be used manipulatively. Some participants held suspicions that the purpose behind Hailey's ability to mimic human emotion was to deliberately and psychologically manipulate consumers.

I'm concerned for younger people in the sense that they need to understand fully that it is not a real... I'm concerned about the people who can't differentiate between a human interaction and a digital interaction. (Molly)

[It] felt like a trick to mimic and mirror human emotions. (Carlton)

It definitely feels like a trick to me. (Levi)

The following section interprets and discusses the significance of these findings and how our results inform and extend understanding of consumers' perceptions and confusion about in-store AIDHs and the subsequent social implications for consumer shopping practices.

4.5 Discussion and Theoretical Contribution

This paper has revealed that consumers engage in cognitive anthropomorphism of in-store AIDHs, causing the technology to be perceived as a social actor making consumer-AIDH interactions fundamentally social. Findings identify the prominence of consumer confusion that negatively affects interactions with the technology. This provides unique contributions to an emerging academic conversation (see, for example, Huh et al., 2022; Jiang et al., 2022; Niemelä et al., 2019) that is exploring the shift of retail technologies from task-orientated machines towards their role and function as social actors within shopping environments. The paper has shown that emerging AI

technologies now have implications within retail environments that the retail technology, CASA, and anthropomorphism literature has yet to understand and account for. An aspect of this that has been demonstrated in this paper is the social complexities of retail AIDHs, specifically how consumers cognitively anthropomorphise AIDHs and the social functionality of the technology that underpins consumers' use of AIDHs within retail settings.

For many consumers, retail AIDHs resemble the form, features, and nature of a human being, which orients consumers' comprehension of the technology towards perceiving them as genuine social actors. This study has taken the knowledge of previous CASA investigations and applied them to a contemporary retail technology (AIDHs) that possesses advanced technological elements (i.e., AI, sophisticated graphical representations of a human face, natural language processing, computer-generated personality) and is specifically designed and framed to imitate an actual human. Evidence has been provided that suggests human-AIDH interactions are fundamentally social for many consumers due to the technological object being perceived by some as a genuine social actor within retail environments. Our findings have illustrated and reinforced the relevance of the automated social presence (ASP) in consumers' perceptions of in-store AIDHs, as conceptualised by Van Doorn et al. (2017).

4.5.1 Physical Anthropomorphism

Our findings contribute to the literature on anthropomorphism in marketing and technology. An AIDH's social presence, as suggested in our data, is partly driven by reactions to their human-like physical appearance and voice, particularly their facial expressions and tone of voice that attempt to mimic genuine human emotion, which elicits an uncomfortable response for some consumers. Such a reaction can be understood when considering the Uncanny Valley theory, first discussed by Mori (1970) and applied by several researchers attempting to understand further robot-human interactions

(Mori et al., 2012; Schneider et al., 2007; Tinwell et al., 2011). This psychological theory states that as an artificial agent begins to reflect a human-like appearance, a point arises at which the object has only subtle deviations from a human. When a non-human object enters the ‘valley’ where it is human-like in appearance but also ‘not quite human’ in its emotional response, this discomfiting chasm can generate a state of unrest (Mori, 1970). Our paper has identified initial evidence of an Uncanny Valley effect being generated by retail AIDHs at their current level of development due to both physical and aural anthropomorphism of the technology.

This study has also demonstrated that consumers can develop perceptions of a retail AIDH’s personality. This process can be partially explained by considering Bruce and Young’s (1986) concept of person perception. Faces convey a wealth of socially relevant information. Person perception explains how actors extract and process this information to form impressions of another’s social categories and personality traits through social conceptual knowledge (Brooks & Freeman, 2019). Our findings show that consumers engage in this process and use their social cognition (Van Doorn et al., 2017) to perceive a retail AIDH.

4.5.2 Cognitive Anthropomorphism

While there was little evidence that consumers perceive retail AIDHs as agentic in terms of their ability to do, plan, and exert self-control (Gray & Wegner, 2012) and affect their operations and circumstances (Bandura, 2006), some evidence indicated that unlike Pitardi et al. (2021), consumers perceive retail AIDHs as capable of forming social judgements to some extent. This causes consumers to feel self-conscious throughout AIDH engagements. Academics understand why an actor can feel self-conscious in social settings (e.g., Jackson and Everts, 2010; Schlenker & Weigold, 1990) and why social judgements are formed (Suzuki et al., 2012). What was less known, however, is how social

anxiety and judgment relate to interaction with non-agentic objects, such as with an AIDH, a nuanced social phenomenon that this study has displayed.

These findings, along with perceptions of human motivations and intentions, provide preliminary evidence that consumers are not only attributing physical human-like characteristics to AIDHs, but are beginning to cognitively anthropomorphise AIDHs by assigning concepts of mind, agency, and human mental states to the technology. Previous CASA investigations found that computers are treated as social actors despite users knowing that the machines are not agentic humans (i.e., selves) and do not possess feelings, intentions, genders, or human motivations (Nass et al., 1994). However, the results of this study suggest that in the case of retail AIDHs, consumer perceptions of more advanced human characteristics are beginning to form, including that of agency.

It is clear from our results that retail AIDHs are not perceived to possess the same level of agency as human beings. However, many consumers consider the technology more agentic than, for example, a self-service checkout. Several participants in our study implied and acted as if the AIDH was agentic to some extent. This adds to the discussions that challenge the dominant assumption of agency (e.g., Choi-Fitzpatrick and Watkins-Smith, 2021) and the emerging theoretical arguments concerning the perceived agency of AI objects (e.g., Sundar, 2020).

4.5.3 Social Engagement with AIDHS

This study has provided insight into how consumers respond socially to the human social elements that are embedded within retail AIDH technology. As suggested by Waytz et al. (2010), interacting with another social actor regulates and guides an individual on how to act in the presence of another entity. Our data aligned with this idea, as retail AIDH users who perceive the technology as a social actor engage in a manner that mimics typical human-human social behaviour. CASA studies found that social norms do not tend to apply to interactions with computers (Nass et al., 1994).

However, our findings indicate that AIDHs trigger consumers' simplistic social norms and scripts, with some shoppers feeling the need to act courteously and reciprocally during interactions. This further challenges the notion of in-store AIDHs as merely technological objects. It extends CASA theory by demonstrating that consumers physically, aurally, and cognitively anthropomorphize retail AIDHs, and that this provokes perceptions of social presence that, in turn, drives social engagement with the technology. Empirical evidence of the CASA theory in the context of retail AIDHs has been provided, strengthening theoretical awareness of the social function of AIDHs. This contributes to the literature by identifying core factors underpinning how consumers perceive and socially respond to retail AIDHs.

4.5.4 Consumer Confusion with AIDHS

The identification of confusion as consumers attempt to comprehend AIDH technology expands an understanding of ambiguity within consumption settings (see, for example, Edward and Sahadev, 2012; Matzler & Waiguny, 2005; Rafiq & Collins, 1996; Walsh & Mitchell, 2010) while identifying a previously unexplored source of consumer confusion (retail AIDHs). The meanings consumers ascribe to AIDHs are not independent of their prior knowledge, experiences, and expectations (Gregory, 1970), much of which is not consciously available for perception when AIDH interactions occur. Consequently, this study has demonstrated how the experience of interacting with a retail AIDH cannot be understood as simple, objective facts, as there is clear evidence that the technology engenders diverse and paradoxical perceptions in the minds of consumers and that this elicits confusion.

Unlike other consumer-facing retail technologies, the uncertainty around what an AIDH is, including what they are capable of, what they are being used for, how they will change shopping practices and the boundaries of engagement, influences consumers' experiences. Many consumers

experience a mind fluster as they attempt to comprehend the inherent contradiction of a technological object attempting to imitate a social agent (human employee). Moreover, our findings show that consumers perceive an AIDH's human-like nature as both artificial and genuine, highlighting a contradiction that stimulates social confusion in the minds of many AIDH users'. This finding continues the discussion of the unintended consequences of AI within business management (see, for example, Achar, 2019; Baabdullah et al., 2021; Mayer et al., 2020; Siau & Wang, 2020; Wirtz et al., 2018) and more specifically, expands understanding of the broader social consequences of AI within the consumption and retail context (Bjørlo et al., 2021; Moore et al., 2022; Puntoni et al., 2021).

The confusion demonstrated in this study may be understood by considering how AIDHs modify the standardised patterns of social behaviour and the social roles enacted within shopping practices. The social world is "first and foremost a system of normative rules and expectations, to which rule-following actors conform" (Reckwitz, 2002, p.256). A distinctive feature of social encounters, such as retail interactions, is the agreed ritualised behavioural patterns that define a social structure (Solomon et al., 1985). Such standards of behaviour form a practice-specific common script which determines a consumer's expected behaviour and that of others, which conceptualises an archetypal service experience (Solomon et al., 1985). The existence of an AIDH, to some degree, disrupts consumers' understanding of retail encounters. If the standardised norms of a specific practice are not adhered to and if there are discrepancies in the script, and if an actor cannot perform socially in the habitual manner which they have learnt, according to Solomon et al. (1985), problems may arise. The current study has indicated that retail AIDHs disrupt this 'service script' (Smith & Houston, 1983). This reaffirms shoppers as social actors who enact behaviours appropriate to their roles in the practice of shopping and demonstrates social tensions that arise when AIDHs disrupt these roles.

4.6 Conclusion

Using the elements of practice theories, this paper makes a clear and significant contribution to the retailing and consumer literature by unpacking the complexities of how consumers perceive and socially respond to retail AIDH. We have revealed and made sense of the novel social complexities that underpin consumer confusion relating to this technology. Through applying CASA theories to in-store AIDH technology, our findings contribute to a theoretical understanding of the social function of consumer-facing retail technologies and the corresponding social implications that this has on the contemporary shopper.

4.7 Managerial Implications

This study demonstrates how consumers use, and would like to use, AIDHs within their shopping practices which provides implications for the design and implementation of retail AIDHs as the technology continues to advance over the coming years. The findings point towards factors that may ensure consumers' experiences with retail AIDHs are optimised, and objections minimised.

When retailers introduce emerging technologies that are too complicated too quickly with little consumer support, our results suggest that consumer confusion will arise. One of the most prevalent responses of our participants to the AIDH was confusion about the nature of the technology. Consumers' difficulty in comprehending AIDHs and subsequent confusion needs to be mitigated and warrants managerial attention. Mitchell and Papavassiliou (1999) suggest that marketing managers need to be responsible for reducing consumer confusion in relation to every aspect of their marketing offering. Our study suggests that retail AIDHs should be included in this responsibility as it cannot be assumed that consumers will be able to seamlessly assimilate and integrate AIDHs into their shopping practices.

Retailers looking to invest in consumer-facing AI would benefit from strategies that help consumers keep pace with the increasing rate at which physical retailer stores evolve. This study has exposed a need for strategies that offer consumers clarity regarding AIDH technology to reduce risk perceptions and stimulate positive consumer-AIDH engagement. Retail managers could help educate consumers not only in terms of the procedures of using their AIDH and how their features may translate into benefits for the consumer but also provide learning regarding what the technology is and the scope of its capabilities. This type of information could be provided through online videos on the retailer's website and social media pages and could even be distributed directly to loyalty card holders via email. Such information generates awareness of the AIDH while equipping consumers with the knowledge necessary to enter AIDH interactions with a degree of familiarity and certainty, thus representing a win-win outcome.

Furthermore, front-end retail staff could act as a vehicle for confusion reduction. Drummond (2004) illustrated the effectiveness of training retail employees to recognise the signs of consumer confusion (e.g., identifying hesitancy) within stores and how to respond appropriately. Training of this nature may be used to instantly mitigate moments of consumer confusion when confronted with an AIDH in-store.

Finally, we note that our findings have clear implications for user interface design and system/policy changes. While retail AIDHs briefly introduce themselves, these introductions focus on introducing the human avatar as a person and have been shown in this study to elicit confusion. These introductions could be expanded to include information about the technology itself to mitigate some of the consumer uncertainties identified within this study.

4.8 Suggestions for Future Research

As human understanding of technology continues to be challenged by the advancement of artificial intelligence, researchers need to continually explore how people comprehend and relate to these obscure and unfamiliar technologies. Notably, many future research avenues relate to our findings around consumer confusion. More research is needed to inform retailers on the potential existence and nature of consumer confusion that may result in response to retail AI technologies, such as AIDHs. Parameters of this confusion, including understanding its specific outcomes, appear to be complicated and need further exploration. Furthermore, while some research has identified ways to mitigate consumer confusion (e.g., Drummond, 2004; Mitchell et al., 2005), there is a need for research that identifies confusion reduction strategies pertaining to in-store AI technologies specifically.

Future research should build on our findings concerning interactions with non-agentic objects, particularly the social mechanisms behind the formation of social anxiety in such situations. More broadly, this study has identified the need for further investigation into the cognitive anthropomorphism and agency perceptions of AI objects as these technologies become more human-like in the future.

It would be interesting to see the results of studies examining other forms of AI technologies with features that the AIDH examined within this thesis lacked. This could include AI built for general-purpose applications, such as Open AI's 'GPT4' or Google's 'Bard'. Empathetic AI that can identify and respond to their user's emotional cues, such as an interface that operates Affectiva's emotional recognition software, must also be explored by researchers within a retail setting. Such AI is currently being developed for service settings (Huang & Rust, 2018), and research into how consumers respond is needed.

Moreover, to examine the evolution of shopper learning, adaptation and coping strategies, longitudinal research would also provide fresh insights into how AIDHs are appropriated within consumers' everyday shopping practices and how consumer comprehension and confusion relating to this technology evolves over time. Finding ways to refine and smooth consumers' transition from human to AI interactions is critical to the success of AI within retailing.

STATEMENT OF CONTRIBUTION DOCTORATE WITH PUBLICATIONS/MANUSCRIPTS

We, the candidate and the candidate's Primary Supervisor, certify that all co-authors have consented to their work being included in the thesis and they have accepted the candidate's contribution as indicated below in the *Statement of Originality*.

Name of candidate:	Simon Moore
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In which chapter is the manuscript /published work:	Chapter Four
Please select one of the following three options:	
<input type="radio"/> The manuscript/published work is published or in press <ul style="list-style-type: none"> • Please provide the full reference of the Research Output: 	
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<input type="radio"/> It is intended that the manuscript will be published, but it has not yet been submitted to a journal	
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Date:	30-Jun-2023
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Chapter Five: Conclusions, contributions, and suggestions for further research

5.0 Overview

The central purpose of this final chapter is to bring together the findings of the three papers to conceptualise the social significance of AIDHs in retail. The chapter begins with an overview of the conclusion before I explain the theoretical significance of this thesis by discussing how the findings contribute to new knowledge. A typology that isolates and organises nine social elements of retail AIDHs, as identified throughout this thesis, is presented and discussed. Several practical suggestions are offered to tech-savvy retailers who have, or intend to, incorporate AIDHs into their frontlines. The chapter and thesis will then conclude by considering the study's limitations and suggestions for future research. To appropriately frame the conclusions of this thesis, here is a recap of the three central research objectives.

Objective 1:

To capture the complexities and dynamics of consumer experiences with AIDHs, focusing on the critical social themes underpinning consumers' interactions with the technology.

Objective 2:

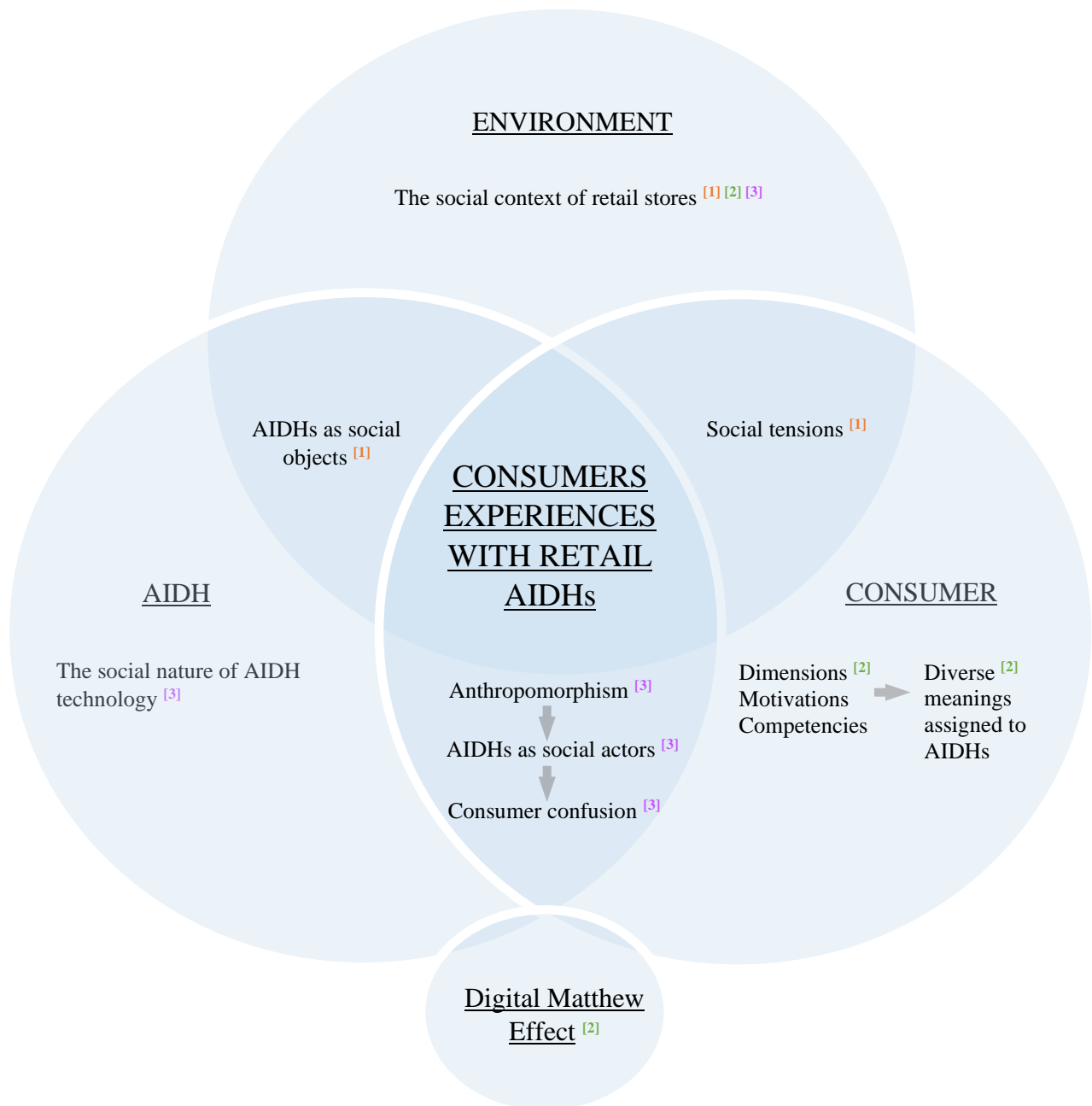
To derive a sociologically informed understanding of the meanings that consumers associate with favourable and unfavourable AIDH interactions and to investigate how these meanings may form the basis of a broader social implication in the form of a shopper-based novel Digital Matthew Effect.

Objective 3:

To understand how consumers comprehend AIDHs, particularly regarding whether retail AIDHs are perceived as social actors and whether interactions with the technology are social experiences. Also, to reveal and make sense of any consumer confusion that may ensue when attempting to comprehend these AI objects.

Figure 6 collates each paper's core findings and theoretical contributions, which will be unpacked and explained throughout this chapter. This framework visualises the social dimensions that play into consumers' experiences with retail AIDHs and acknowledges the social implications that emerge when the technology is integrated into physical retail environments. It represents the social elements embedded into consumers' shopping practices after implementing retail AIDHs. The numbers that appear alongside each element represent the paper from which they emerged and the research objective they relate to.

Figure 6: Conceptualisation of results



5.1 Conclusions

This thesis has broadened the theoretical and practical understanding of the social dimensions of AI within a retail context. Specifically, this thesis has unravelled the social dimensions that determine consumers' experiences with retail AIDHs and the social implications of the technology that were previously unknown at this preliminary stage of the AI retail revolution. As the literature

review illustrated, this research was necessary as the social implications pertaining to the recent shift of retail technologies from task-orientated machines towards their role as social actors within shopping environments were under-researched, given their potential significance. There was a noticeable paucity of research that considered consumers' actual experiences with AIDHs in a naturalistic shopping context, which prevented a contextualised understanding of the technology's nuanced social impacts on consumers' shopping practices. This knowledge gap was problematic considering the increasing rate at which contemporary retail consumers encounter AIDHs within their shopping environments. This thesis has demonstrated that social implications do stem from retail AIDHs and that these are, in fact, significant from the consumer perspective.

Three exploratory scholarly papers that collectively capture the niche social dynamics that underpin consumer-AIDH interactions have been provided. They offer a rich, qualitative account of consumers' shopping practices with AIDHs. They have concluded that social dimensions play a pivotal role in consumers' experiences with AIDHs and that the technology has a profound social impact on its users. These insights also lay the theoretical foundation for wider social consequences in the form of a novel shopping-based Digital Matthew Effect.

Through an appreciation of the social implications of AIDHs in retail, this thesis has delivered a qualitative sociological understanding of consumers' shopping practices with AIDHs, while extending the growing sociological-informed debates focusing on shopping and marketplace behaviours (Elms et al., 2016). This thesis has continued scholarly discussions about the unintended consequences of AI within business management (i.e., Wirtz et al., 2018; Baabdullah et al., 2021; Siau & Wang, 2020; Achar, 2019; Mayer, 2020). Unique and significant theoretical contributions to the consumption, retailing and social technologies literature have been provided by uncovering the unforeseen, potentially unintended, social dimensions and implications of AIDHs in retail. The following section unpacks each of these contributions.

5.2 Theoretical Contributions to Knowledge

By taking retail AIDH research in a direction that others have not, this thesis has provided new knowledge to the marketing, consumption, and retailing literature. Through the exploration of consumers' experiences with an AIDH within their in-situ shopping environment and by analysing the process and outcomes through a practice lens, the three papers presented within this thesis have provided empirical evidence that supports several propositions pertaining to the social significance of AIDHs in retail and the formation of unique theoretical contributions.

The central theoretical significance of this thesis has come from revealing and unpacking the social function of retail AIDHs and the corresponding social implications that this has on the contemporary shopper. Empirical evidence of the social dimensions determining consumers' experiences with AIDH has been provided. I propose that retail AIDHs serve as social objects that transform the social environment of a retail store. This research shows that the technology delivers satisfying experiences independent of its practical utility. Consumers have developed new social trends in response to this aspect of retail AIDHs. Shoppers have identified and refined ways of inciting amusement and social enjoyment from interactions with the technology. This establishes the sociality of AIDH interaction while illuminating the social nature of shopping practices more generally. Moreover, there is clear evidence that AIDHs engender novel, diverse, and paradoxical social responses from consumers, such as concerns about how the technology relates to the need for human interaction versus the need to avoid human interaction. This provides further insight into the social outcomes of implementing AIDHs within retail environments by contributing a more nuanced account of the significance of the technology on a social level.

By acknowledging and accounting for the robust social contexts within which shopper-AIDH interactions occur, social dimensions have been shown to play an active and influential role in

consumers' motivations and experiences with the retail object. This thesis reveals that an impetus to engage or avoid AIDHs, for example, comes partially from other peoples' existence at the moment of interaction. Consumers experience a sense of social consciousness when using retail AIDHs due to the social nature of retail environments. This social response significantly impacts consumers' experiences with AIDHs. Likewise, this thesis has revealed and unpacked a contemporary social phenomenon; how social anxiety and judgment relate to interactions with a non-agentic object (an AIDH). These social tensions are integral to consumers' attempts to reconfigure their shopping practices following AIDH deployment. Complex social-spatial and temporal contexts, therefore, significantly shape interactions with the technology. This contribution links to that of Mark Ritson (see, for example, Ritson & Elliott, 1995; Ritson & Elliott, 1999), who examined the influence of the social contexts that often constitute advertisement consumption rather than taking the more typical approach of asking consumers about their isolated experiences and perceptions. Similarly, by moving away from the more prosaic outcomes of AIDHs, this thesis has uncovered new knowledge similarly by focusing on the influence of social contexts and subsequently revealing how AIDHs are more accurately experienced within shopping practices. This reaffirms social dimensions as an influential aspect that shape the consumption process.

In addition to the social context's significant influence on AIDH interactions, this thesis has provided evidence that consumer-AIDH encounters are fundamentally social for many consumers. AIDHs can be perceived as genuine social actors, with consumers applying their social cognition to develop personality perceptions of the technology. This proposition provides a unique contribution to theory. The thesis has shown that emerging AI technologies now have implications within retail environments that the retail technology, CASA, and anthropomorphism literature has yet to understand and account for. An aspect of this that has been demonstrated in this thesis is the social complexities of retail AIDHs, specifically the social functionality of the technology and how this impacts consumers' shopping processes. Consumers have been shown to physically, aurally, and

cognitively anthropomorphise AIDHs. This provokes perceptions that AIDHs carry a social presence that drives social engagement with the technology. Therefore, empirical evidence of the CASA theory in the context of retail AIDHs has been provided, strengthening the theoretical awareness of the social function of the technology. This contributes to the literature by identifying some core factors underpinning how consumers perceive and socially respond to retail AIDHs.

Additional theoretical impact comes from identifying a new and previously undiscussed form of consumer confusion that expands understanding of ambiguity within consumption settings (see, for example, Edward and Sahadev, 2012; Matzler and Waiguny, 2005; Rafiq and Collins, 1996; Walsh and Mitchell, 2010). I propose that consumers feel a unique confusion as they attempt to comprehend a technological object (an AIDH) imitating a social agent (human employee). This thesis has shown that consumers perceive an AIDH's human-like nature as both artificial and genuine, highlighting a contradiction that stimulates social confusion in many AIDH users' minds. Confusion of this nature disrupts consumers' experience with retail AIDHs. This expands the theoretical understanding of the contexts that give rise to consumer ambiguity within modern consumption settings. Likewise, retail AIDHs provoke the Uncanny Valley Effect, which leaves consumers unsettled and produces confusion. This thesis shows that retail AIDHs tend to modify the standardised patterns of social behaviour, provoking further confusion regarding the social roles enacted within shopping practices. When applied to interactions with a non-human social actor such as an AIDH, the role-taking process is complex and uncertain. This reaffirms shoppers as social actors who enact behaviours appropriate to their roles within the practice of shopping by demonstrating the social tensions that emerge as consumer roles are disrupted and confused by AIDHs.

The theoretical understanding of user competence when interacting with AI conversational interfaces has expanded. While technical skill is essential when engaging with many retail technologies, this thesis has demonstrated that AIDHs require users to acquire a new skill set to enjoy and optimally utilise the technology. Consumers must develop the ability to communicate in a style

conducive to the technology's language comprehension software. This adds to the understanding of the communicative differences between human-human interactions and human technology while refining awareness of how an agent's competence shapes their experiences within practices. Moreover, new retail technologies such as AIDHs can make consumers feel that their shopping knowledge and skills may no longer suffice. This builds on the works of practice theorists by emphasising the tension-ridden process of actors transitioning from a position of mastery to beginner levels of competence when faced with a modified in-store context that disrupts their stable habits and practice.

Regarding the social implications of retail AIDHs at a societal level, this thesis has projected that diverse consumer responses to the technology and the significant shopping advantages offered by AIDHs result in a novel consumption-based Digital Matthew Effect. Empirical evidence has supported the proposition that an actor's dispositions, motivations, and competencies determine the extent of friction experienced when interacting with AIDH. This significantly shapes whether consumers attach favourable or unfavourable meanings to their interactions with the technology and shows that some consumers will be drawn to the technology while others repelled. I, therefore, suggest that the shopping advantages offered by retail AIDHs will not be equally distributed among consumers. This represents a broader social implication of the AIDHs.

Moreover, this thesis has offered new knowledge by bringing consumers' relationships and responses to innovations to the forefront by identifying resistance that comes not from demographic measures but from an interplay between sociological and shopper elements derived from theories of social practice principles. This represents an additional theoretical contribution as it builds awareness of the keystones that may form an AIDH-based Digital Matthew Effect and demonstrates the analytical effectiveness of social practice theories in developing a broader appreciation of consumer engagement with new retail technologies. Likewise, this thesis has revealed that consumers'

temperamental and motivational tendencies and degrees of competence are foundational drivers and inhibitors of retail AIDH readiness.

A final contribution comes from understanding how Digital Matthew Effects may be more carefully understood when viewed under the lens of practice. A new contribution to literature demonstrates the utility of considering social dimensions when examining Digital Matthew Effects. This thesis has demonstrated the explanatory power of practice theories as a framework for understanding the intricacies underpinning an emerging digital divide, equipping researchers with a tool to foresee the social implications, intended or otherwise, derived from new technologies.

5.2.1 Towards a Typology of the social elements of Retail AIDHs

The scholarly contributions from this thesis outline how social dimensions play an active and influential role in consumers' experiences with AIDHs. They also acknowledge the social implications that emerge when AIDHs are deployed within retail environments. These contributions build towards a typology that isolates nine central social elements that underpin and result from retail AIDHs. Table 4 organises these social elements by classifying them into two types; (1) the social dimensions that impact consumers' experiences with AIDHs in retail and (2) the social implications of the technology as identified throughout this thesis. The typology below, therefore, represents a theoretical understanding of the social significance of AIDHs in retail. It provides an organising framework for considering the implications of the technology from a social perspective. A summary of the nine elements is then provided.

Table 4: Towards a typology of the social dimensions and implications of AIDHs in retail

Social elements	Social dimension	Social implication
1. AIDHs generating new social possibilities		Yes
2. The social context of retail stores	Yes	Yes
3. Social tensions	Yes	Yes
4. The need for human interaction paradox	Yes	Yes
5. The need to acquire new skillsets	Yes	Yes
6. Digital Matthew Effect		Yes
7. Perceptions of AIDHs as social actors	Yes	
8. Social responses to AIDH	Yes	Yes
9. Consumer confusion	Yes	Yes

1. AIDHs that generate new social possibilities

AIDHs act as social objects that enable new social possibilities and opportunities. This has profound behavioural and emotional implications for consumers' experiences with the technology. AIDHs stimulate the social environment of retail stores by providing a social resource that enables social action. They provide social entertainment and satisfaction for consumers and their social groups independent of their practical utility and offer shoppers a novel opportunity to engage in playful and friendly conversational exchanges with the avatar. Consumers have developed new trends in response to the social aspect of AIDHs by developing and refining ways of inciting amusement and social enjoyment from interactions with the technology. Uncovering the social function of retail AIDHs stands out as the keystone contribution of this thesis because of its pivotal role in explaining how the technology is primarily integrated into consumers' shopping practices. This contribution not only

addresses the core objectives outlined in my research objectives and encapsulates the essence of my thesis but also significantly advances knowledge relating to the social impact of AIDHs in a retail context.

2. The social context of retail stores

Consumers' experiences with retail AIDHs cannot be understood without accounting for the robust social contexts within which interactions occur. In line with the research that has discussed how the behaviour/experience of each human within a retail store can impact that of others (see, for example Andajani et al., 2014; Nasermodeli et al., 2013; Peter & Olson, 2008; Verhoef et al., 2009), the existence of other people, including those that are interactive and noninteractive, creates sensations such as a fear of appearing incompetent which significantly determines the nature of a consumer's interaction with an AIDH. This can make or break consumers' experiences with the technology. Complexities of the social nature of physical retail stores encourage and discourage consumers from engaging with AIDHs, which extends the growing sociological-informed debates focusing on shopping and marketplace behaviours (Elms et al., 2016).

3. Social tensions

Social tensions, including social anxiety, social judgement, and social consciousness, are integral to consumers' experiences with AIDHs and their attempts to integrate the technology into their shopping practices. Consumers tend to feel unwanted negative attention is drawn to them if they do not use AIDHs correctly, which extends the academic conversation regarding insecurities that arise during interactions with consumer-facing retail technologies (Bulmer et al., 2018; Elms & Tinson, 2012). Consumers feel uncomfortable and vulnerable as they transition from being a customer who could

complete a shopping journey autonomously and competently to a shopper who may require assistance to operate a retail AIDH effectively. This hurts their sense of self-worth and social identity as competent shoppers.

4. The need for human interaction paradox

There is also clear evidence that AIDHs provoke paradoxical social responses from consumers, particularly regarding the need for human interaction/need to avoid interaction. AIDHs alter the interpersonal dynamics between consumers and employees in-store by offering an alternative to a human employee. Some consumers desire and highly prioritise the emotional-social outcomes of personal interaction during service encounters, while others seek out AIDHs to avoid interaction with store personnel. This builds on the works of others who have studied the nature of consumers' need for human interaction within retail stores (Dabholkar, 1996; Dabholkar & Bagozzi, 2002; Lee & Yang, 2013) by expanding the theoretical understanding of how the perceived reduction in human interaction that results from the deployment of AIDHs is experienced by consumers.

5. The need to acquire new skillsets

My results have emphasised the importance of competence when engaging with a retail AIDH. The extent to which consumers feel competent while interacting with in-store AIDHs determines the quality of their experiences with the technology. While technical skill is necessary when using an AIDH, as it is when operating other forms of SSTs (e.g., Dabholkar and Bagozzi, 2002; Elliott et al., 2012; Flavián et al., 2022; Kaplan & Haenlein, 2019), this thesis has shown that AIDHs require their users to acquire a new skill set – the ability to communicate and socialise with the technology in a style that is conducive to the technology's language comprehension software. This adds to understanding the communicative differences between human-human and human-technology interactions (e.g., Hill et al. 2015) while refining awareness of how a consumer's

competence shapes their experience within practices. While Chattaraman et al. (2019) investigated the effectiveness of different conversational styles used by AI conversational interfaces, I have explored the flip side of the coin (i.e., challenges related to the conversational style of humans as they engage with retail AIDHs).

6. A Digital Matthew Effect

A consumer's dispositions, motivations, and competencies determine consumers' willingness to engage with, and effectively use, AIDHs in-store and influence the extent of friction experienced when interacting with the technology. This significantly shapes the social meanings consumers attach to AIDHs and determines the quality of shoppers' experiences with the technology. Some consumers are, therefore, drawn to AIDHs, while others are repelled. This suggests that the shopping advantages offered by retail AIDHs will not be equally distributed. Many researchers have spoken about the importance of identifying new digital Matthew effects as they emerge (Dwivedi et al., 2021; Joyce et al. 2021; Carter et al., 2020), and this thesis has shown that retail AIDHs may produce a novel shopper-based Digital Matthew Effect that comes not from demographic factors but from a combination of sociological and shopper elements from the theories of social practice framework. How Digital Matthew Effects may be more carefully understood when viewed under the sociocultural lens of practice theories has therefore been demonstrated.

7. Perceptions of AIDHs as social actors

Throughout this research, an unexpected revelation emerged as the most surprising and captivating aspect. For many consumers, retail AIDHs resemble the form, features, and nature of a human being, which orients consumers' comprehension of the technology towards perceiving them as genuine

social actors. Consumers not only attribute physical human-like characteristics to AIDHs but are beginning to cognitively anthropomorphise the technology by assigning concepts of mind, agency, and human mental states to the technology. This provokes perceptions of the technology as a social actor, significantly shaping how consumers engage and their experiences with the technology. Consumers can feel socially self-conscious due to perceptions that the AIDH may judge and can use their social cognition (Van Doorn et al., 2017) to perceive a retail AIDH. This thesis has identified initial evidence of an Uncanny Valley effect (Mori, 1970) being generated by retail AIDHs and extends the CASA paradigm (Nass et al., 1995; Reeves & Nass, 1996) by suggesting that in the case of retail AIDHs, consumer perceptions of advanced human characteristics are beginning to form. This unforeseen finding not only challenges conventional wisdom but also opens up new avenues of research within the retail-technology literature.

8. Social responses to AIDHs

Consumer-AIDH experiences are fundamentally social for many shoppers. AIDHs make consumers feel they need to respond socially to them and tend to interact with the technology in a way that mimics interactions with human employees. AIDHs trigger consumers' basic social norms and scripts, with shoppers tending to act courteously and reciprocally, reflecting a social approach to interactions with AIDHs. This strengthens theoretical awareness of the social function of the technology and provides empirical evidence of the CASA paradigm in the context of retail AIDHs.

9. Consumer confusion

Consumers can become confused as they attempt to comprehend and mentally process the concept of an AIDH. Consumers struggle to make sense of a situation where a social actant (a human employee)

is being replaced by a non-social actant (an AIDH) that is imitating a social actant. For many consumers, this unusual form of social confusion significantly determines the quality of their experiences when engaging with the technology. Uncertainty around what an AIDH is, including what they are capable of, what they are being used for, how they will change shopping practices, and the boundaries of engagement, influences consumers' experiences. The same consumer can perceive an AIDH's human-like nature as both artificial and genuine, a contradiction that stimulates confusion. AIDHs also modify the standardised patterns of social behaviour within shopping environments, which provokes confusion regarding consumers' social roles enacted within shopping practices. The identification of this form of consumer confusion expands understanding of ambiguity within consumption settings (Edward & Sahadev, 2012; Matzler & Waiguny, 2005; Rafiq & Collins, 1996; Walsh & Mitchell, 2010) while identifying a previously unexplored source of consumer confusion within physical retail environments. Identifying and characterising this confusion stands out as a central contribution of this thesis as it introduces a novel outcome of AI-retail technology and a new direction for the retail-technology literature.

5.3 Summary of Managerial Contributions

This thesis demonstrates how consumers use, and would like to use, AIDHs within their shopping practices which provides implications for the design and implementation of retail AIDHs as the technology continues to advance over the coming years. The findings presented within this thesis provide retailers with a foundational understanding of retail AIDHs as experienced by consumers. Those commissioning AIDHs envisage improvements in their service offering and concomitant cost savings. However, such an outcome requires retailers first to understand their consumers' needs and concerns in relation to AIDHs, including how the technology is used. Indeed, this exploratory study provides retailers an alternative to the 'barrel forward and hope for the best'

implementation strategy. Understanding how consumers integrate AIDHs into their shopping practices can help retailers identify opportunities to enhance the overall customer experience. The findings of this study point towards factors that may ensure consumers' experiences with retail AIDHs are optimised and objections minimised, and thus have strong practical implications when thinking about the future of retail frontlines as retailing enters a period of both transformation and unprecedented change.

Consumers want to engage in socially satisfying exchanges with retail AIDHs. There is tremendous scope for trialling different approaches to use the technology to engender genuinely pleasing social situations in-store. This thesis has generated a strong argument to further develop the social functionality of retail AIDH technology. For instance, I believe there may be potential for an AIDH to offer a greater degree of social conversational options to encourage more social rather than practical exchanges, especially if a group rather than a solo shopper approaches. Retailers might consider the potential for a broader range of (optional) social/fun interactions. These could be simply designing the AIDH to play short games with shoppers (noughts and crosses, eye spy etc.) or even a guessing game where "she" attempts to guess which type of product the consumer wants to buy based on clues the consumer provides. In extending this agenda, retailers currently pitch AIDHs as a tool to assist consumers with their shopping journey, while the 'fun' factor has been somewhat overlooked and under-communicated. However, the findings of this study imply that media messages and publicity surrounding the launch of AIDHs need to highlight the uses beyond practical and informational applications. The hedonic and social benefits of interacting with AIDHs can lead to enhanced consumer experiences, but this potential will remain largely unrealised unless consumers are made aware.

Our results suggest that when retailers introduce emerging technologies that are too complicated too quickly with little consumer support, consumers will experience problems. The social tensions, consumer confusion, and disruptions to normal shopping practices uncovered in this

thesis need to be managed and mitigated. Mitchell and Papavassiliou (1999) suggest that marketing managers need to be responsible for reducing consumer confusion in relation to every aspect of their marketing offering. This thesis suggests that retail AIDHs should be included within the scope of this responsibility, as it cannot be assumed that consumers will accurately assimilate and seamlessly integrate AIDHs into their shopping practices. Strategies that offer clarification regarding AIDH technology and information that guides various in-store practices relating to this new technology appear crucial. This could be achieved through several practical interventions, including:

- Providing details on the correct procedures necessary to operate effectively, such as where to stand, what to talk into, which button to press and hold, how loudly to speak, the clarity of communication required, etc.
- Providing information about how AIDHs features may translate into benefits for the consumer.
- Providing learning opportunities around AIDH technology and the scope of its capabilities.
- Demonstrating to consumers the necessary communication style and the questions that can be asked.

Such information generates awareness of AIDHs while equipping consumers with the knowledge necessary to enter AIDH interactions with a degree of familiarity and certainty. Clear communication and transparency about retail AIDHs, including assuring customers about data security and privacy, may help to build trust and limit consumers' concerns about privacy, security, and the ethical use of AI in retail. Proactively addressing privacy concerns and broader ethical considerations, such as the impact of AIDHs on employment, may help align the technology with consumer values and expectations. Educating consumers about AIDHs may reduce the uncertainty and anxiety currently limiting the use of this technology within retail stores. It may also spur interest/excitement, restrain apathy, and help consumers derive value from the technology, thus

representing a win-win outcome. This type of information and guidance could be offered to consumers through a variety of methods, such as, for example:

- Online videos on the retailer's website and social media pages.
- Information distributed directly to loyalty card holders via email.
- Programming AIDHs to walk new consumers through a basic tutorial and training exercise that includes information about the technology.

Retailers also need to ensure that employees are sufficiently trained to work alongside AIDH and support consumers' adoption of the technology. This may involve investing in training programs to help employees understand AIDHs effectively. Employees need to be able to explain the technology to consumers, including what it will be used for and how to use it effectively to negate consumer resistance. Front-end retail staff could also act as a vehicle for confusion reduction. Employees could be trained to recognise the signs of consumers' confusion (e.g., identifying hesitancy) within stores and how to respond appropriately.

The participants in this study have highlighted the need for retailers to monitor and adapt to consumers' evolving sentiments about retail AIDHs. Retail managers need to stay attuned to developments in consumers' attitudes towards the technology and be prepared to modify strategies accordingly. Additionally, the participants in this research have clarified that what constitutes a positive experience for one consumer might be the very thing that leads to a bad experience for another shopper. Therefore, choice rather than imposed technology appears to be the key to success, considering the social consequences of AI in retail on consumers' experiences and shopping practices. Thus, at this stage, retailers would do well to think of AIDHs not as a replacement for frontline employees but rather as an addition to the physical retail environment.

Moreover, many of these implications relate directly to the technology's user interface and system design. AIDHs represent the beginning of AI technology at a consumer-facing level within

retail stores. Further development of AIDHs or similar frontline AI retail technologies must be directed towards meeting consumers' needs relating to the technology, including how it will be used within their shopping practices. As AIDHs become more advanced over the following years, there is a need for this technology to appreciate the nuances of the social context if it is to have broader appeal. Shoppers have increasingly sophisticated options for shopping online, so having socially satisfying in-store technological experiences is particularly important if retail stores are to flourish in the future.

5.4 Limitations

While the methodological approach selected for this discovery-orientated research was appropriate for eliciting richly contextualised accounts of consumers' experiences with an AIDH in a naturalistic retail setting, it has limitations. The constraints of this thesis stem from several factors. The scope of this study is limited to a single setting, and the findings are drawn from interviews and observations from a limited number of people, all of whom are based within the Auckland region. A wider range of settings and broader geographical catchment might have strengthened the robustness of theory development and identified additional social elements of AIDHs that were not discussed throughout this thesis.

However, the intent of this thesis was to construct the theoretical foundations that explain how consumers respond to an obscure, disruptive, and emerging advanced technology. The core purpose was to understand retail AIDHs as consumers experience them within their specific shopping environment, a type of insight that statistical procedures and numeric data would not capture. The findings discussed throughout this thesis are bound to the specific case. The insights are used as a basis for generating new knowledge about the social implications of retail AI technologies and how they shape consumer shopping practices.

5.5 Empirical Direction for Further Research

My exploration into consumers' experiences with AIDHs has generated several interesting and diverse research areas that serve as new directions for the academic community. For instance, a theme throughout this thesis was that consumers hold several security, trust, and safety concerns about AIDHs. As AIDHs enable companies to construct automated consumer interactions that mimic real human exchanges, retailers face a novel set of ethical issues. Many of the participants in this research questioned the principles of AI and the potential for the technology to be misused or exploited within shopping settings through managerial processes. This calls for further research into the ethical, moral and privacy issues arising from retail AI. Likewise, the concept of Corporate Digital Responsibility (CDR), as discussed in recent research (Lobschat et al., 2021; Mueller, 2022; Wirtz et al., 2021), may need prompt and ongoing scholarly attention in the context of retailers' use of AIDHs throughout the ongoing service revolution. Research into the appropriate uses of advanced AI technologies in retail is needed to ensure that unwanted consequences are mitigated and that consumers continue to be treated ethically as contemporary retail settings become more technologically sophisticated.

While this thesis has primarily focused on consumer practices with AIDHs, retailers are beginning their AI journeys (or in the early stages) (Guha et al., 2021). The unique intricacies, considerations and difficulties that underpin how AI technologies become integrated into a retailer's frontline operations provide an interesting and necessary perspective for academics to consider. Insights into the evolving retail strategies relating to AIDHs, including how retailers respond to challenges and how strategies form and alter as retailers and consumers become more familiar with the technology, are needed as part of a holistic understanding of AI in retail. In a similar light, research into how a retailer's approach to AI may be differentiated and positioned in the competitive landscape may provide value from a practical perspective and produce new knowledge and interesting angles from a theoretical point of view.

Numerous research opportunities build directly from the core findings of this thesis. Clearly, there is a need for further research on consumer engagement with AIDHs, particularly focusing on developing managerial insights that encourage less eager consumers to engage with the technology. Further studies should be undertaken to identify the critical success factors in consumers' experiences with retail AIDHs, particularly in reducing social tensions. For example, the balance between consumers' need to interact with human employees and their need to avoid human contact requires more scholarly attention. Additionally, many future research avenues relate to my findings around fun and the heightened hedonic aspects of consumer-AIDH interactions.

As humans understanding of technology continues to be challenged by the advancement of AI, researchers need to continually explore how people comprehend and relate to these obscure and unfamiliar technologies. Such research might, for example, monitor consumers' increasing tendency to relate socially with AI objects by investigating the extent of cognitive anthropomorphism and social agency perceptions of technology as it becomes more human-like in the future. The extent to which the perceived autonomy of AIDHs is valued by consumers appears necessary given the findings of this study. Likewise, identifying consumer confusion with retail AI technology establishes a necessary avenue of retail research. More research is needed to inform retailers about the potential existence and nature of consumer confusion resulting from retail AI technologies. Parameters of this confusion, including understanding its specific outcomes, appear to be complicated and need further investigation. So too, is research into effective confusion reduction strategies that retailers could apply to deter the AIDH confusion shown in this study to damage consumers' experiences with the technology.

Now that this thesis has theorised a retail AIDH-based Digital Matthew Effect, future research should monitor the existence and extent of this unintended social outcome as AIDHs become more advanced and widespread. It will be necessary to identify if, how, when, and to what extent AI users

obtain the substantial advantages that the technology promises within a shopping context and within all domains that AI is expected to transform over the coming years. Identifying those who are advantaged and disadvantaged through new AI digital divides will play an essential role in managing and mitigating the broader social inequalities that arise from AI technologies moving forward.

This thesis has focused solely on a single technology. However, future studies may explore the formation of Digital Matthew Effects associated with other novel retail technologies, particularly through a practice theory lens. Future research may also wish to consider a broader range of potential social consequences that may currently be unforeseen. For instance, how retail AI might socially implicate retail employees, not only from a job security perspective but also whether the technology acts as a social stressor, influencing employees' role identity and sense of autonomy in-store.

This thesis has opened a new research agenda that offers significant potential by demonstrating the explanatory power of practice theories as a framework for revealing unique and significant mechanisms that underpin consumer responses and outcomes to AIDH. Theories of practice can be utilised by researchers who wish to investigate the social dynamics that explain how actors relate to new objects that enter their communities of practice. While it remains necessary to explore and theorise the functional implications of new technologies, the practice theory lens could be used in future research to examine broader implications of new technologies, particularly those that are social in nature, equipping researchers and practitioners with a tool to foresee the implications of innovations from a novel perspective. This thesis has led the way for other researchers to examine the social influence and outcomes of new retail technologies through the lens of practice.

Exploring the implications of AIDH technology in diverse retail contexts (i.e., banking, apparel, convenience etc.) provides an obvious next step for academics wishing to study retail AI technologies. An important extension of this thesis involves the consideration of other forms of AI technologies that have features that the AIDH studied within this thesis lacked. This could include AI

built for general-purpose applications, such as Open AI's 'GPT4' or Google's 'Bard'. Empathetic AI that can identify and respond to their user's emotional cues, such as an interface that operates Affectiva's emotional recognition software, also needs to be explored by researchers within a retail setting. Consumer attitudes and behaviours towards AIDHs may evolve over time. Longitudinal research is therefore needed to understand how AIDHs are appropriated within consumers' everyday shopping practices over a more extended period. Such a study would offer further understanding of the development of consumers learning, adaptation and coping strategies pertaining to AIDHs and provide fresh insights into how consumer comprehension and confusion with technology evolves over time.

This thesis has shown that finding new ways to delight and amuse shoppers is central to the future of customer experience management within retailing. Identifying strategies that smooth consumers' transition from human to AI interactions provides the basis for a future academic agenda. Understanding the implications and consumer needs as they relate to AIDHs to refine and enhance the implementation of this emerging retail technology is critical to the success of AI within retailing.

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