

# **Subjective Age and Consumer Behaviour**

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## Abstract

Fuelled by increased life expectancy and an unprecedented cultural obsession with youthfulness, contemporary society is witnessing a growing fascination among individuals with their ageing process. Rather than passively accepting their age, consumers are actively engaged in monitoring and managing their ageing journey. This trend is illustrated by the rapid expansion of the anti-ageing and longevity sectors, as well as the increasing prevalence of various media formats dedicated to ageing, including best-selling books, podcasts, and streaming videos. As a result, the subjective perception of one's age is becoming increasingly crucial, overshadowing the significance of objective age.

Prior research in developmental psychology and gerontology has revealed that subjective age—referring to how old an individual feels—can predict important developmental and psychological outcomes. However, limited studies have explored how subjective age influences consumer behaviour and decision-making processes, highlighting the need for further research to address critical research gaps. Thus, this thesis aims to paint a more comprehensive picture of how subjective age shapes consumer behaviour.

The first essay, titled “Is Technology the New Fountain of Youth?: Feeling Older Increases the Consumption of New Technologies,” investigates how a temporary increase in subjective age influences the adoption of new technologies. Drawing upon previous research on compensatory consumption, the research proposes that consumers will strategically gravitate toward new technologies when they feel older, as they perceive a greater potential for these technologies to provide a sense of youthfulness. Three controlled experiments provide converging evidence supporting this prediction.

The second essay, “Feeling Younger and Acting Greener: The Impact of Subjective Age on Sustainable Consumption,” examines how momentary shifts in subjective age influence sustainable consumption. Building upon previous research on consumer identity, the research suggests that consumers prefer sustainable products when they feel younger, as these products align well with their activated youthful age identity. The results from three lab experiments

support this proposition.

Combined, the findings of the thesis address research gaps and offer theoretical and practical implications. Theoretically, it enriches the discourse on the malleability of subjective age, expanding its influence into two pivotal consumer realms: new technology adoption and sustainable consumption. Additionally, it provides unique insights by presenting evidence for both a contrast and an assimilation effect of subjective age. Moreover, it uncovers two distinctive underlying mechanisms—perceived youthfulness provision and perceived fit. Furthermore, it underscores that shifts in subjective age impact consumers across all adult demographics, not solely older adults. From a practical standpoint, the findings of the thesis equip marketing practitioners and policymakers with tools to promote the consumption of new technologies and sustainable products by actively crafting marketing strategies that induce feelings of being older or younger.

*Keywords: subjective age, new technology, compensatory consumption, sustainability, identity, perceived fit, youthfulness*

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## **Attestation of Authorship**

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which, to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

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**Daniel Chaein Lee**

October, 2023

## Declaration of Authorship

Chapter	Manuscript Details	Author Contributions Description
4	<b>Title:</b> Is Technology the New Fountain of Youth?: Feeling Older Increases the Consumption of New Technologies <b>Status:</b> Submitted <b>Journal:</b> <i>Journal of Service Research</i>	PhD Candidate: Research & Writing (90%) Co-Author: Supervision (10%)
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The undersigned hereby certify that the above details correctly reflect the nature and extent of the PhD candidate's contribution to the work undertaken for each of the submitted peer-reviewed manuscripts, and the nature of the contribution of the co-author.

**PhD Candidate**

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## **Ethical Approval**

Ethics approval from Auckland University of Technology Ethics Committee (AUTEK) was granted on 15th February 2022 for a period of three years until 15th February 2025. The ethics application number is 22/19.

# Chapter 1. Introduction

## 1.1. Research Background

In contemporary culture, there is a growing preoccupation among individuals with their own ageing process. Rather than passively accepting their age, people are actively involved in monitoring and managing the ageing journey. Consequently, subjective perceptions of age are becoming increasingly important, overshadowing objective age. This shift is fueled by various factors, including increased life expectancy, which has shifted societal focus from simply prolonging life to enhancing its quality (Goldsmith, 2019), and an unprecedented cultural emphasis on youthfulness that influences not only the older population but also the younger generation (Guiot, 2001; Twigg & Majima, 2014).

The growing fascination with the ageing process is evident in both the public and media spheres. For instance, the emergence of *Blue Zones*, regions associated with long life spans, has been prominently featured in the Netflix series “Live to 100: Secrets of the Blue Zones.” Experts like Peter Attia, whose bestselling book *Outlive: The Science & Art of Longevity* delves into longevity science, have captured widespread attention. Additionally, podcasts hosted by experts such as Andrew Huberman offer accessible insights into the science of longevity, further fueling public interest (Heller, 2023). Similarly, Bryan Johnson, an anti-ageing tech entrepreneur, has garnered significant media attention for his *Blueprint* protocol, aimed at reversing his biological age and potentially extending his lifespan (Pringle, 2024).

The burgeoning interest in ageing is mirrored by the growth of industries in the business sector. For example, the global market for anti-ageing products, valued at US\$38.9 billion in 2022, is projected to reach US\$60 billion by 2030, with an expected compound annual growth rate (CAGR) of 5.6% from 2022 to 2030 (Research and Markets, 2023). Moreover, acknowledging the potential of this market, billionaires such as Jeff Bezos, Mark Zuckerberg, and Sam Altman are making significant investments in anti-ageing science to extend the human lifespan (Richardson, 2023). This recognition extends to the public sector as well. For instance, the Singaporean government has implemented proactive measures to tackle the challenges

posed by its ageing population. In 2015, the city-state launched a comprehensive action plan focused on promoting successful ageing, named “I Feel Young SG” (Singapore Ministry of Health, 2023).

The aim of this thesis is to explore how the increasing focus on subjective experiences of ageing influences consumer behaviour, utilising the concept of subjective age—the age at which individuals feel they are (Barak & Stern, 1986). Previous research in gerontology and developmental psychology indicates that subjective age is a powerful predictor of developmental and psychological outcomes. For instance, subjective age predicts physical and cognitive functioning, psychological well-being, overall life satisfaction, and even mortality more effectively than chronological age does (Debrecezeni & Bailey, 2021; Stephan et al., 2018; Westerhof & Barrett, 2005; Westerhof et al., 2014; Wettstein et al., 2021).

While it is conceivable that subjective age may have implications for consumer behaviour, its impact has not been thoroughly examined within marketing and consumer research. Therefore, this research aims to bridge this gap and paint a more comprehensive picture of how subjective age shapes consumer behaviour. Exploring subjective age in consumer research remains relatively new and underdeveloped (Amatulli et al., 2018; Park et al., 2021). The current body of knowledge lacks the breadth and depth necessary to fully comprehend the extent of its influence on consumer behaviour. This thesis aims to bridge this gap by investigating the role of subjective age in shaping consumer choices and preferences, along with the underlying processes. This will contribute to the evolving understanding of the interplay between subjective age and consumer behaviour.

To expand our knowledge about the potential impact of subjective age in consumer research, the thesis integrates the concept into two significant consumer contexts: new technology adoption (Essay 1) and sustainable consumption (Essay 2). Given the rapid pace of technological development and escalating environmental threats, these areas provide a relevant and intriguing context for further exploring the role of subjective age.

The first essay, “*Is Technology the New Fountain of Youth?: Feeling Older Increases the Consumption of New Technologies,*” investigates whether and how subjective age can increase the acceptance of new technologies. In today’s youth-oriented society, which promotes

an anti-ageing sentiment (Guiot, 2001; Twigg & Majima, 2014), consumers often experience unease about ageing. Drawing upon the literature on compensatory consumption, which posits that consumers use symbolic consumption to alleviate discomfort arising from discrepancies between their desired and actual selves (Mandel et al., 2017), the essay explores whether consumers would gravitate towards new technologies when they feel older in the expectation that these products or services can potentially restore a sense of youthfulness.

The second essay, “*Feeling Younger and Acting Greener: The Impact of Subjective Age on Sustainable Consumption*,” focuses on the widespread belief that younger consumers are more active and likely to be sustainable than older consumers and asks whether simply making consumers feel younger would result in increased sustainable consumption regardless of their actual age. Building upon previous research on consumer identity that shows consumers are motivated to choose products that are consistent with their accessible identity (Aaker et al., 2001; Hong et al., 2000; Lau-Gesk, 2003), the essay explores whether consumers will prefer sustainable products when they feel younger, as these products align well with their activated youthful age identity.

## **1.2. Research Objectives**

The primary purpose of the thesis is to examine the impact of the momentary shifts in subjective age on new technology acceptance and sustainable consumption while elucidating the underlying processes of these effects. In doing so, it aims to provide a more comprehensive understanding of subjective age’s impact on consumer behaviour. Specifically, the thesis will investigate the following research questions:

**RQ1.** How would shifts in subjective age influence consumers’ preferences for new technologies/sustainable products?

**RQ2.** What mechanism will underly this effect?

**RQ3.** What are the boundary conditions?

## **1.3. Significance of the Research**

This thesis intends to provide several theoretical contributions. First, the research aims

to expand the burgeoning literature on the malleability of subjective age and its downstream effects on consumer behaviour. Recent research on subjective age has revealed that it is a malleable construct influenced by situational factors (Mock & Eibach, 2011; Stephan et al., 2013). However, to date, there have been only a few studies exploring the impact of temporary shifts in subjective age on consumer preference and choice. For instance, Amatulli et al. (2018) demonstrated that feeling younger increases the preference for contemporary products over traditional ones among older consumers, while Park et al. (2021) found that feeling older increases prosocial behaviour among non-elderly consumers. By examining the impact of subjective age in two crucial consumer domains, namely new technology adoption and sustainable consumption, the research aims to significantly broaden the scope of existing literature.

Second, and more importantly, this thesis aims to reveal two distinct mechanisms through which the temporary increase or decrease in subjective age influences consumer behaviour. While there has been growing interest in the impact of subjective age in consumer research (Amatulli et al., 2018; Park et al., 2021), our understanding of its underlying processes remains limited. In Essay 1, it was proposed that an expectation that new technologies will bestow a sense of youthfulness (i.e., perceived provision of youthfulness) will underlie the impact of feeling older on the acceptance of new technologies. In Essay 2, it was suggested that the perceived fit between consumers and sustainable products would mediate the effect of feeling younger on the choice of sustainable products. By uncovering the underlying mechanisms through which momentary shifts in subjective age alter consumer behaviour, the thesis aims to provide a more comprehensive picture of the literature.

Third, while examining the impact of subjective age on these two consumer domains and illuminating the underlying processes, the thesis aims to enrich the respective bodies of literature. In Essay 1, the research will contribute to the literature on new technology acceptance. Previous studies in this field have predominantly shown that consumers adopt new technologies for utilitarian and hedonic purposes (Davis et al., 1989; Kulviwat et al., 2007; Melumad & Pham, 2020; Ziamou & Ratneshwar, 2002). However, Essay 1 will demonstrate that consumers also choose new technologies to signal their desired self-concept, thus

expanding the limited body of research that has explored consumers' utilisation of new technologies for self-related reasons (Rauschnabel, 2018; Wood & Hoeffler, 2013).

Fourth, the thesis also aims to contribute to the compensatory consumption literature by illustrating how situational shifts in subjective age can trigger compensatory consumption. Previous research has uncovered various sources of self-discrepancies that prompt compensatory consumption, such as power (Rucker & Galinsky, 2008) and self-view confidence (Gao et al., 2009). More closely aligned with the present work, previous studies have also shown that critical demographic variables, such as gender identity (White & Argo, 2009; Willer et al., 2013), can elicit compensatory consumption. The thesis will expand the literature by introducing age perception as another important variable.

Fifth, through Essay 2, the thesis intends to contribute to the literature on sustainable consumption. Previous research has revealed that numerous factors can influence consumers' preferences for sustainable products or services (Kim et al., 2020, 2022). One such factor is consumers' identity. Previous research has primarily focused on how a pro-environmental identity influences sustainable actions (e.g., Bartels & Hoogendam, 2011). However, Essay 2 research will expand the literature by revealing that self-concepts seemingly unrelated to sustainability (i.e., age identity) can also shape sustainable consumption.

Sixth, from a managerial perspective, this thesis aims to equip marketers and policymakers with tools to influence the consumption of new technologies and sustainable products. By strategically shifting consumers' subjective age through marketing campaigns or retail experiences that evoke either younger or older subjective ages, companies will have the potential to enhance the appeal of their offerings and stimulate consumption.

#### **1.4. Thesis Structure**

The rest of this thesis is structured as follows: First, a comprehensive literature review covering the existing research on subjective age and identifying research gaps will be provided (Chapter 2). Then, the research methodology employed will be outlined (Chapter 3). After a brief introduction summarising its key points (Chapter 4), the first essay will be presented, which has been submitted to the *Journal of Service Research* (Chapter 5). Then, after another

short introduction (Chapter 6), the second essay, submitted to *Psychology & Marketing*, will be presented (Chapter 7). The final chapter will synthesise the findings of the two essays, assess theoretical and practical contributions, discuss limitations and future research avenues, and provide an overall conclusion (Chapter 8).

## Chapter 2. Subjective Age

Age is a concept familiar to everyone and has received extensive attention in consumer research. However, the literature on subjective age suggests that there is a subjective dimension to the ageing process that can provide more accurate predictions of various outcomes than actual age. This chapter will review the literature on subjective age, specifically focusing on its definition and measurement and exploring its antecedents and consequences.

### 2.1. Definition and Measurement

Subjective age refers to how young or old an individual perceives themselves (Barak & Stern, 1986). It is a matter of perception (Barrett, 2003) and can differ from chronological age (Kleinspehn-Ammerlahn et al., 2008). While people often feel older than their actual age in their early years, they feel increasingly younger than their actual age beyond their mid-twenties (Montepare & Lachmann, 1989; Rubin & Berntsen, 2006). This tendency to feel younger is a global phenomenon (Barak et al., 2001; Barak, 2009), and this trend intensifies with each passing year (Wettstein et al., 2023). The correlation between subjective and chronological age is surprisingly weak, ranging from .26 to .42 (Kastenbaum et al., 1972), suggesting the influence of various factors on one's self-perceived age.

Some researchers have approached subjective age as a multidimensional construct. For example, Kastenbaum et al. (1972) identified four dimensions: felt age (how older adults feel based on their self-perception), look age (based on physical appearance), act age (based on typical activities), and interest age (based on interests). Subjective age can be viewed as either a stable individual difference (Westerhof et al., 2003) or a temporary mental state (Eibach et al., 2010). However, subjective age is most often measured using a single-item scale: e.g., "How old do you feel now?" (Amatulli et al., 2018) "What age do you feel most of the time?" (Barrett, 2003; Westerhof et al., 2003; Mock & Eibach, 2011). Other researchers, however, also preferred multi-item scales (e.g., Kastenbaum et al., 1972). It is essential to consider the implications of feeling like a certain age may differ for individuals of different chronological ages. Therefore, subjective age research often utilises the concept of youth age, which represents the discrepancy

between subjective age and chronological age, to capture the extent to which individuals feel younger or older than their actual age (Barak, 1987).

In this thesis, subjective age is defined as a unidimensional construct of feel-age, indicating how old or young an individual feels. This definition aligns with the dominant practice in the literature (Barak & Stern, 1986; Kotter-Grühn et al., 2015; Peluso et al., 2021; Stephan et al., 2015). This decision is based on both practical and theoretical considerations. Practically, this unidimensional approach is simpler to interpret and administer compared to multi-item scales. Theoretically, feel-age is viewed as the most pertinent dimension of subjective age and serves as a reliable indicator of how individuals perceive their own age (Zacher & Rudolph, 2019). In contrast, multi-dimensional assessments of subjective age, such as those proposed by Kastenbaum et al. (1972), have faced criticism. One concern is that the four items in these measures may represent different aspects of how individuals perceive their age and, therefore, should be treated separately (Kotter-Grühn, Kornadt, & Stephan, 2016). Additionally, there are doubts about whether these four items provide a consistent representation of the underlying concept (Guido, Amatulli, & Peluso, 2014). Indeed, some studies have chosen to eliminate one or more of these items (e.g., Guiot, 2001), while others have introduced new items (e.g., Edgar & Bunker, 2013; Zacher & Rudolph, 2019; see Peluso et al., 2021 for more).

## **2.2. Subjective Age Bias**

As mentioned above briefly, there is a general tendency to feel younger. When adults are asked how old they feel most of the time, they report feeling considerably younger than their actual age (e.g., Montepare & Lachmann, 1989), a tendency often referred to as subjective age bias in the literature (Weiss & Weiss, 2019). Several explanations have been proposed to account for this general tendency to underestimate one's age. Below, each explanation will be briefly summarised, and their respective advantages and disadvantages will be discussed.

### **2.2.1. Information Processing Account**

First, an information processing approach can explain a youthful subjective age. People

feel younger than their actual age because their perception is influenced by an “inner prototype image,” which consists of age schemata from both the past and the present. For example, a 60-year-old man today may appear much younger than a 60-year-old man from 30 years ago, leading to age underestimation. Consequently, feeling young results from cognitive processing, as people look younger than in the past. If the information processing approach is valid, age underestimation should occur not only in assessing one’s age but also when assessing the age of others. This is precisely what Teuscher (2009) demonstrated. Participants similarly underestimated their age (by an average of 5.67 years) and the age of completely unknown individuals based on their pictures (by an average of 4.68 years).

The advantage of the information processing approach is that it explains why people tend to underestimate their age and the age of others. Subjective age bias occurs because people tend to look younger than the inner prototype image associated with a certain age. Notably, the information processing account views age as neither inherently good nor bad, which sets it apart from the two motivational accounts that will be discussed shortly. However, a significant limitation of this approach is its inability to account for interpersonal or intrapersonal variability. Individuals within the same culture will likely share the ‘inner prototype image’ and remain relatively stable over time. Consequently, the information processing approach struggles to effectively explain differences within and between individuals.

### **2.2.2. Self-enhancement Account**

Second, subjective age bias may be attributed to the motivation to feel good about themselves. Due to the self-enhancement motive, most people overestimate their qualities and abilities (Gramzow et al., 2003). In today’s youth-oriented society, where youth is highly valued, and ageing is often negatively stereotyped, feeling young can be seen as a specific form of self-enhancement strategy. Teuscher (2009) provided empirical support for this argument in two ways. First, attitudes towards ageing moderated the extent to which subjective age correlated with life satisfaction. Compared to those who view ageing positively, those with negative perceptions of ageing felt younger. In other words, a youthful subjective age had a self-enhancing effect primarily for those who considered the aging process undesirable. Second,

subjective age correlated with other constructs associated with self-enhancement, including optimism, self-efficacy beliefs, and life satisfaction (Myers & Diener, 1995).

The advantage of this account lies in its capacity to explain inter-individual variability in subjective age bias, as individuals exhibit varying levels of the self-enhancement motive. Furthermore, the self-enhancement account can elucidate why age underestimation increases throughout one's lifetime and also account for age overestimation among adolescents and younger adults.

### **2.2.3. Self-protection Account**

The third and related account is self-protection or stereotype-threat defence. In today's youth-oriented culture, ageing is often considered undesirable, and old age is associated with negative stereotypes (e.g., senile, forgetful, etc.). While positive stereotypes (e.g., wise) do exist, they are less dominant. People feel threatened by the expectation of being stereotyped as old and distance themselves from an older age group by feeling younger. Previous research provides evidence for the self-protection account. In a longitudinal study, Kornadt et al. (2018) found that people felt younger over time in domains where negative ageing stereotypes are common (e.g., bad health and poor work performance) compared to positive domains (e.g., family leisure). Similarly, older adults felt younger when confronted with negative age-related stereotypes than when positive or neutral age-related stereotypes were presented (Weiss & Lang, 2012). Amatulli et al. (2018) further showed that older adults (aged 65+) felt younger when they imagined the presence of younger adults (versus older adults). Importantly, this effect disappeared when participants had high self-esteem, supporting the argument that feeling young is an attempt to protect oneself from negative stereotypes.

Like the self-enhancement account, the self-protection account is motivational in nature. Therefore, it is valuable in explaining both inter- and intra-individual differences in subjective age bias. The self-protection account appears particularly useful in explaining why people tend to feel younger than their chronological age as they age. Conversely, the self-enhancement account seems more relevant in explaining why people may feel *older* in their early life and during their twenties.

#### **2.2.4. Summary**

In summary, at least three reasons in the existing literature explain the general tendency for individuals to feel younger than their chronological age. The information processing account is cognitive, while the self-enhancement and self-protection accounts are motivational. In the latter two, ageing is perceived as unfavourable, while youth is seen as positive. However, this perception might be reversed at earlier life stages. Adolescents and individuals in their early twenties often report feeling older than their actual age. The information processing account, on the other hand, remains neutral, viewing ageing neither as positive nor negative. Collectively, all three accounts suggest that subjective age is socially constructed. Absent social influences, we would identify solely with our chronological age.

### **2.3. Antecedents of Subjective Age**

Previous research has identified several antecedents of subjective age. Correlational studies have highlighted various demographic, developmental, and psychological factors. Furthermore, recent experimental studies have demonstrated that contextual factors can also induce temporary shifts in subjective age. These antecedents will be discussed in detail.

#### **2.3.1. Demographic, Developmental, and Psychological Factors**

First, subjective age tends to increase with chronological age (e.g., Chéron & Kohlbacher, 2018), although this association weakens over time (Barrett, 2003). Individuals typically start feeling younger than their age beyond their mid-twenties (Montepare & Lachmann, 1989; Rubin & Berntsen, 2006). This trend is intensifying as historical time advances (Wettstein et al., 2023). Still, the correlation between subjective and chronological age is surprisingly modest, ranging from .26 to .42 (Kastenbaum et al., 1972). As for gender disparity, women feel younger than men, and this gap is pronounced as people get older (Wettstein et al., 2023).

Second, health-related factors play a significant role in determining subjective age. Better physical functioning (Stephan et al., 2015) and higher perceived health (Spuling et al., 2013; Stephan et al., 2012) are associated with feeling younger subjectively. Furthermore, even

daily fluctuations in health perception can influence one's subjective sense of ageing (Kotter-Grühn et al., 2015).

Third, cognitive functioning is another significant predictor of subjective age. For instance, individuals with better episodic memory tend to feel younger (Hughes & Lachman, 2018). Merely perceiving oneself to have performed well in cognitive tests can also reduce subjective age (Hughes et al., 2013).

Fourth, several psychological factors are predictive of subjective age. Individuals tend to feel younger when they have a greater sense of control over their lives (Bellintier & Neupert, 2020), hold more positive views about their ageing process (Kornadt et al., 2018), and score higher on extraversion and openness (Infurna et al., 2010).

### **2.3.2. Situational Factors: Subjective Age's Malleability**

Importantly, recent research on subjective age has highlighted its malleability. Contrary to the belief that subjective age is a stable disposition, it is shifted by situational factors. For instance, older adults tend to feel older after engaging in activities such as reading low-visual-fluency materials (Eibach et al., 2010) or participating in memory tasks (Hughes et al., 2013). Conversely, individuals can feel younger after receiving positive feedback following a hand-grip task (Stephan et al., 2013) or imagining themselves in hedonic contexts rather than utilitarian ones (Guido et al., 2014).

This new research paradigm overcomes the limitations of correlational studies, allowing for causal inferences and opening up possibilities for intervention studies. However, the number of controlled experiments conducted in this area is relatively limited, leaving ample room for future research to explore this promising field further.

## **2.4. Consequences of Subjective Age**

Subjective age would be only meaningful when it predicts other outcomes. Previous research in gerontology, psychology, and consumer research has accumulated evidence regarding the various consequences of subjective age.

### **2.4.1. Developmental and Psychological Consequences**

First, subjective age has a negative relationship with both physical and mental health. By examining 19 longitudinal studies, Westerhof et al. (2014) revealed that feeling younger subjectively predicted better health, more health-promoting behaviours, and increased life expectancy. Conversely, feeling older subjectively was associated with a higher risk of depressive symptoms over time (Choi & DiNitto, 2014; Spuling et al., 2013).

Second, cross-sectional and longitudinal studies have demonstrated that older subjective age is related to poorer psychological well-being. For instance, subjective age is negatively associated with life satisfaction (Westerhof & Barrett, 2005), self-efficacy (Boehmer, 2007), and self-esteem (Barak & Stern, 1986).

Third, subjective age has also negatively affected cognitive functioning (Choi & DiNitto, 2014; Stephan et al., 2014). For example, baseline subjective age has been shown to predict executive function and episodic memory performance 10 years later (Stephan et al., 2014).

Fourth, subjective age has been found to predict mortality (Stephan et al., 2018; Westerhof et al., 2014). Analysing data from three national-level longitudinal samples, Stephan et al. (2018) demonstrated that older subjective age was associated with a higher mortality risk.

Fifth, longitudinal studies have indicated that older subjective ages contribute to personality changes. Stephan et al. (2015) discovered that feeling older at baseline predicted a steeper decline in extraversion over a 10-year period.

Sixth, subjective age also has important implications for psychological variables. For example, life satisfaction, subjective well-being resilience to stress (Debreczeni & Bailey, 2021; Westerhof & Barret, 2005; Wettstein et al., 2021).

### **2.4.2. Consumer Consequences**

Consumer researchers have long been interested in subjective age (Barak & Schiffman, 1981). The primary appeal of subjective age in consumer literature lies in the expectation that it can serve as a superior tool for segmentation compared to chronological age. Within the consumer domain, feeling younger has been associated with more active sensation seeking

(Stephens, 1991), engagement in fashion-related behaviours (Lin & Xia, 2012), and a higher propensity for trying new brands (Gwinner & Stephens, 2001).

Some recent research has investigated the influence of situational activation of younger or older subjective age on consumer behaviour. Two recent studies stand out. Amatulli et al. (2018) demonstrated that older participants felt younger in the presence of younger individuals (compared to older individuals), and this shift in subjective age led to a greater likelihood of choosing contemporary products over traditional ones. Park et al. (2021) showed that participants who compared themselves to younger or older individuals experienced shifts in their subjective age due to a contrast effect. Moreover, participants who felt older also felt a stronger sense of social responsibility, which motivated them to engage in more prosocial actions. These studies suggest that the malleability of subjective age offers an intriguing perspective through which to examine consumer behaviours.

In summary, subjective age research in the consumer literature is still in its early stages but holds great potential for further exploration. Studies by Amatulli et al. (2018) and Park et al. (2021) have examined subjective age as a malleable construct that can be influenced by situational interventions, leading to significant consumer outcomes. While this area of research shows promise, its current extent is somewhat limited.

## **2.5. Mechanism: From Subjective Age to Its Consequences**

It has been discussed above that subjective age is malleable and thus can be shifted using situational intervention. It has also been highlighted that such shifts can have meaningful consequences. An important question is the underlying processes through which shifts in subjective age influence thoughts and behaviours. However, exploring these underlying mechanisms is still limited in the existing literature. Prior research has suggested three potential mechanisms, some of which have empirical support while others are more speculative: self-concept, age-related lay beliefs or norms, and self-efficacy.

First, previous studies have consistently shown that older adults with a younger subjective age are more inclined to try new brands (Gwinner & Stephens, 2001) and exhibit greater interest in fashion brands (Lin & Xia, 2012). This pattern has been replicated in lab-

based experiments. Amatulli et al. (2018) showed that older adults felt younger after imagining the presence of younger individuals, leading them to choose more contemporary options over traditional ones. However, the underlying reasons for this consistent pattern in subjective age literature have not been fully explored. One possible explanation is related to consumers' self-concepts. Subjective age plays a significant role in shaping one's self-concept (e.g., Steitz & McClary, 1988) and individuals tend to behave in a manner consistent with their self-concept (Sirgy, 1982). Therefore, individuals who perceive themselves as younger in subjective age are motivated to think and act in ways associated with younger individuals, leading them to prefer options (e.g., contemporary products) that align with this self-perception.

Second, subjective age can influence attitudes and behaviours through age-related norms or lay beliefs. Park et al. (2021) manipulated the subjective age of non-elderly adults (aged 18 to 60) and found that feeling older increased prosocial behaviours. The underlying mechanism of this effect was the sense of responsibility toward the greater good, which is based on the common lay belief that individuals should contribute to society as they get older.

Third, another potential underlying mechanism suggested in previous research is self-efficacy. Stephan et al. (2013) demonstrated that older adults who were told that they performed better than their same-aged peers in a hand grip task reported feeling younger and performed better on the subsequent trial than those who did not receive such feedback. The authors suggested that feeling younger may have increased self-efficacy and been responsible for this effect, but this possibility has not been empirically tested.

Overall, although some studies (Amatulli et al., 2018; Park et al., 2021; Stephan et al., 2013) have shown how temporarily shifted subjective age can influence attitudes and behaviours, it is worth noting that only Park et al. (2021) delved into the underlying mechanisms. This highlights an area ripe for further research opportunities.

## **2.6. Gaps in the Literature**

To summarise, subjective age is a promising concept to explore for consumer research. Particularly, subjective age's malleability and its downstream effects enable marketers and policymakers to impact consumer behaviour by altering feelings of being younger or older.

Although only a limited number of consumer studies have employed this approach thus far (Amatulli et al., 2018; Park et al., 2021), there is significant potential for future research in this field.

### **2.6.1. Limited Scope within Consumer Research**

First, prior research on subjective age in consumer literature has focused on a limited range of consumer domains, such as fashion (Lin & Xia, 2012), new product trials (Gwinner & Stephens, 2021), prosocial behaviour (Park et al., 2021), and organic food consumption (Septianto & Kemper, 2021). However, numerous other domains exist in which feeling younger or older may influence consumer behaviour. For example, it would be intriguing to investigate whether subjective age impacts consumer preferences and choices regarding new technologies or sustainable products. Exploring subjective age within these additional domains has the potential to broaden the scope of our knowledge and uncover new underlying mechanisms specific to the consumer contexts of interest. Consequently, there is a compelling need for further research in these areas to enrich our comprehension of how subjective age influences consumer behaviour.

### **2.6.2. Limited Knowledge on the Underlying Process**

Second, our understanding of how shifts in subjective age influence consumer behaviour remains limited. This limitation is quite understandable, given that the research domain is still in its early stages. One identified underlying mechanism is the sense of responsibility rooted in age-related lay beliefs, which propose that individuals should contribute to society as they age (Park et al., 2021). Other suggestions, such as self-efficacy (Stephan et al., 2013), are speculative and have not yet undergone empirical testing. Thus, there is a pressing need for further research to investigate these potential mechanisms and uncover additional factors that might be at play.

### **2.6.3. Possibility of Contrast Effect**

Third, previous research has primarily demonstrated an assimilation effect, linking

feeling younger with outcomes associated with younger individuals and feeling older with outcomes linked to older individuals. However, considering the motivational factors of self-protection (2.2.3.) and self-enhancement (2.2.2.) influencing subjective age, alongside the prevalent anti-ageing sentiment in modern society (Guiot, 2001; Twigg & Majima, 2014), there is a possibility of observing a contrast effect. This suggests that feeling older, being an aversive state may motivate consumers to think and act as younger individuals would. Consequently, consumers may exhibit behaviours associated with younger individuals as a strategy to cope with the adverse feelings of ageing.

#### **2.6.4. Research Focused on Older Adults**

Fourth, while research has primarily focused on how feeling younger affects older consumers, there has been a notable oversight regarding its impact on younger individuals. Subjective age research traditionally originates from gerontology, naturally emphasising older and middle-aged adults. However, given the prevalent cultural emphasis on youth and the constant reminders of age in daily life, it is plausible that younger individuals are also sensitive to shifts in subjective age. In fact, interest in the ageing process begins at a young age (Dolan, 2021), indicating the relevance of considering subjective age across different age demographics. Thus, there is an opportunity to investigate the role of subjective age among younger individuals.

#### **2.6.5. Lack of Ecologically Valid Intervention Methods**

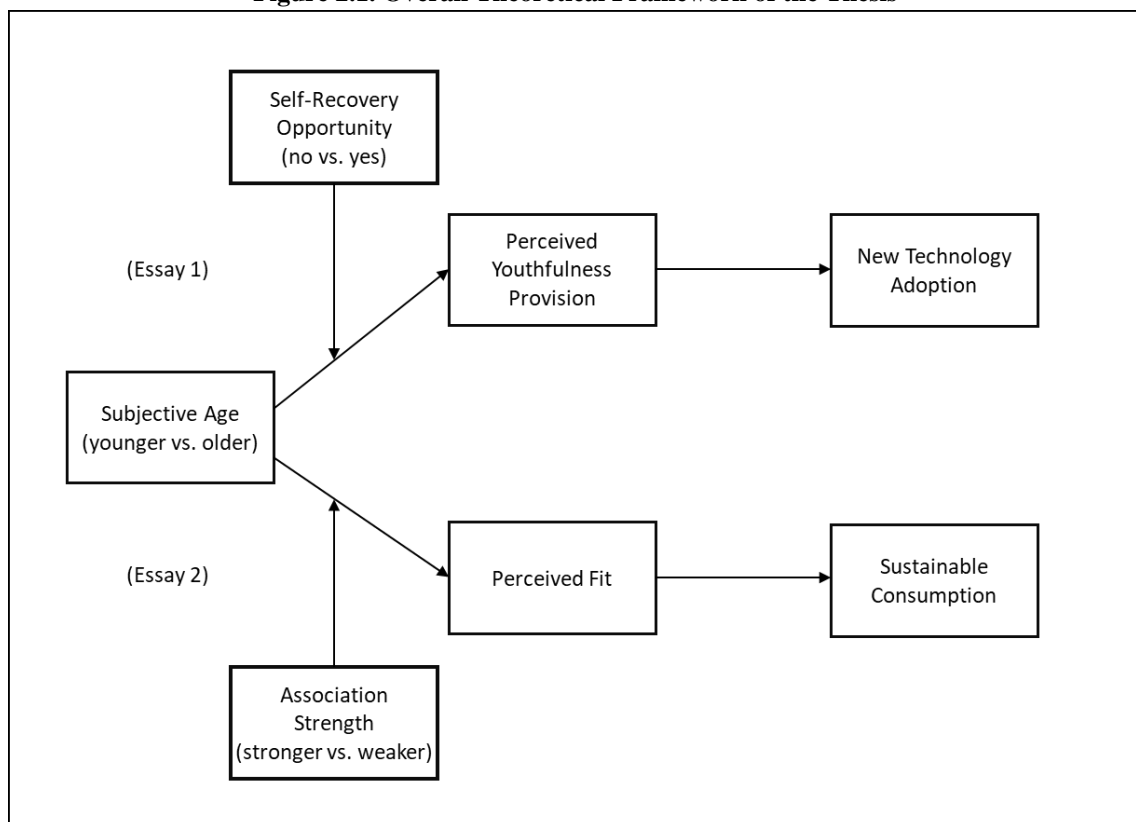
Fifth, extant literature provides limited knowledge about how to shift subjective age in an ecologically valid manner. Although previous research has demonstrated that subjective age can be altered through behavioural interventions (Amatulli et al., 2018; Eibach et al., 2010; Hughes et al., 2013; Park et al., 2021; Stephan et al., 2013 Weiss & Lang, 2012), it is crucial to explore manipulation techniques that are relevant and applicable within consumer settings. Future studies could investigate various approaches and assess their effectiveness in real-life scenarios. By doing so, they can advance our comprehension of subjective age and acquire valuable insights for practical applications in marketing and policymaking.

Overall, subjective age research in consumer behaviour offers exciting opportunities for further exploration across various domains and mechanisms. By expanding our knowledge and understanding in these areas, we can unlock the full potential of subjective age as a tool for marketers and policymakers.

## 2.7. Theoretical Framework

Figure 2.1. presents the overall theoretical framework. Essay 1 aims to explore the relationship between subjective age and the adoption of new technology. It will argue that inducing an older subjective age among participants enhances their propensity to adopt new technology, with the perceived notion that such technology can contribute to a sense of youthfulness mediating this effect. Additionally, it will be proposed that this effect weakens when consumers have an opportunity to restore their sense of youthfulness before being exposed to new technologies.

**Figure 2.1. Overall Theoretical Framework of the Thesis**



In Essay 2, the focus will be on examining the influence of subjective age on sustainable consumption. It will suggest that feeling younger will result in a greater preference

for sustainable products, and that consumers' perceived fit with sustainable products acting as a mediator. Furthermore, it will propose that this effect diminishes when the association between sustainability and the younger generation is weakened.

*Subjective age* refers to the perception of one's own age in comparison to others (Barak & Stern, 1986; Kotter-Grühn et al., 2015; Peluso et al., 2021; Stephan et al., 2015). In Essay 1, *new technology adoption* signifies consumers' willingness to adopt and use new technologies (e.g., Davis, Bagozzi, & Warshaw, 1989). *Perceived youthfulness provision* refers to consumers' belief that new technologies can impart a sense of youthfulness. *Self-recovery opportunity* indicates whether consumers are given a chance to restore their sense of youthfulness before encountering new technologies. This concept is drawn from research on compensatory consumption (e.g., Gao et al., 2009), which suggests that when consumers perceive a misalignment between their ideal and actual selves, they tend to engage in consumption behaviours aimed at restoring their ideal self-image.

In Essay 2, *sustainable consumption* denotes consumers' preference for eco-friendly products, such as choosing green products over non-green ones (Brough et al., 2016; Newman et al., 2014). *Perceived fit* reflects consumers' perception of how well sustainable products align with their identity (Lee et al., 2012; Ostinelli & Luna, 2022; Wang et al., 2012). *Association strength* indicates the extent to which consumers perceive sustainable products as linked to younger generations.

## **Chapter 3. Methodology**

### **3.1. Controlled Online Experiments**

Building upon established literature regarding the malleability of subjective age, the chosen methodology for investigating research questions centred on controlled experiments. This approach was favoured due to its ability to offer precise control over independent and extraneous variables, thereby facilitating the establishment of causal relationships between variables of interest (Rosenthal & Rosnow, 2008). Of particular interest to the thesis is examining the impact of momentary shifts in subjective age rather than focusing solely on more stable, trait-like subjective age. Recognising this, experimental manipulation emerged as an effective strategy to explore this question, providing a clear and structured pathway for investigation.

Data collection was conducted online through Amazon Mechanical Turk (MTurk), a crowdsourcing platform that provides a convenient and efficient means to gather the required data. However, concerns have been raised regarding the quality of data obtained from MTurk, which has been attributed to factors such as inattention. In response to these concerns, the thesis incorporated recommendations from prior researchers aimed at enhancing data quality (Aguinis et al., 2021; Hauser et al., 2022; Kim, 2023). For data collection on MTurk, we utilised CloudResearch, whose Approved Participants feature enabled the drawing of data from a subset of the MTurk population, thereby improving data quality compared to direct sampling from MTurk (Hauser et al., 2022). Furthermore, to minimise the impact of participants' involvement in other projects, surveys were strategically posted during non-peak hours. Additionally, the survey design was meticulously crafted to ensure simplicity and clarity, aiming to counteract any potential lack of motivation among participants. Attention checks were thoughtfully incorporated to maintain data integrity and engagement throughout the survey (Kim, 2023).

### **3.2. Participants**

Aligning with the thesis's emphasis on understanding the impact of subjective age

across entire adult age groups, the present research will focus on adult participants aged 18 and above. Additionally, participants will be those who reside in the United States and whose native language is English. This was necessary because the survey relied on English proficiency for tasks such as reading, responding, and occasionally writing. Moreover, this deliberate decision aimed to maintain consistency and reduce unnecessary variability among participants. Following the recent practice in consumer research, the sample size will be determined using the G\*Power program (Faul et al., 2007).

### **3.3. Study Design**

Both essays will employ a series of three studies to investigate the research questions comprehensively. In each essay, the first study will examine the proposed relationship between subjective age and the main dependent variable (i.e., new technologies or sustainable consumption). The second study will then test the hypothesis regarding the underlying mechanism, providing insights into the processes involved. To further validate the proposed theoretical framework, the third study will explore the boundary conditions of the effect, examining the circumstances under which the focal effect is mitigated. In other words, the third study will utilise a “moderation-of-process” approach, which complements the “measurement-of-mediation” approach of the second study, providing a more comprehensive understanding of the underlying mechanism of the proposed effect (Kim et al., 2023). This multifaceted approach enhances the validity and generalizability of the findings, enriching our understanding of the role of subjective age in shaping consumers’ choices and preferences regarding new technology and sustainable products.

### **3.4. Study Material**

In Essay 1, subjective age will be manipulated using a writing task (Study 1) or an imagination task (Studies 2 & 3). In the writing task, participants will either be asked to write about things that make them feel old or young (adapted from Jiang et al., 2021). In the imagination task, participants will imagine a scenario where they feel old compared to a control

condition. Two manipulation checks will be employed: participants will report their chronological age (“How old are you?”) and subjective age (“How old do you feel right now?”), A youth-age index will be calculated by subtracting the latter from the former (Amatulli et al., 2018). Additionally, participants will indicate their perceived age on a 100-point slider scale ranging from 1 (*extremely young*) to 100 (*extremely old*; Park et al., 2021). New technology adoption will be measured by assessing participants’ relative preference for new technology or non-technology options, using stimuli adapted from previous research (Kim et al., 2021) or developed for each study. The perceived youthfulness provision, the proposed mediator, will be gauged using a 2-item measure (“Using new technology can make people feel younger” and “A person who uses new technology looks young”) ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

In Essay 2, subjective age will be manipulated by prompting participants to contrast their current self with their younger or older self (Study 1; Park et al., 2021) or by using the writing task from Essay 1 (Studies 2 & 3). Manipulation checks will involve participants reporting their chronological and subjective ages, as in Essay 1. The dependent variable will be participants’ preference for more or less sustainable options, measured using items borrowed from previous research (Yan et al., 2021) and supplemented with new materials developed as necessary. Additionally, perceived fit will be assessed using a one-item measure (“Sustainable products are a good fit for me”; adapted from Ostinelli & Luna, 2022), ranging from 1 (*not at all*) to 7 (*very much*).

More detailed information will be available in Chapters 5 and 7.

### **3.5. Analysis**

In Essay 1, Study 1 will analyse the influence of subjective age on the dependent variable using a one-way ANOVA. Study 2 will employ one-way ANOVAs on both the dependent and mediator variables. Study 3 will utilise logistic regression for the dependent variable, a two-way ANOVA for the mediator, and the SPSS Process Macro #7 for moderated mediation analysis.

In Essay 2, Study 1 will examine the impact of subjective age on the dependent variable

through a one-way ANOVA. In Study 2, one-way ANOVAs will be conducted on both the dependent and mediator variables. Study 3 will employ a two-way ANOVA for the dependent variable.

## Chapter 4. Prelude to Essay 1

The ensuing chapter presents the first essay, titled “Is Technology the New Fountain of Youth?: Feeling Older Increases the Consumption of New Technologies,” which examines the relationship between subjective age and the adoption of new technologies (RQ1), along with its underlying process (RQ2) and a boundary condition (RQ3). Drawing upon previous research on compensatory consumption, the research work proposes that consumers will strategically gravitate toward new technologies when they feel older in an attempt to regain a sense of youthfulness. Three controlled experiments provide converging evidence supporting this prediction, shedding light on the relationship between momentary shifts in subjective age consumers’ adoption of new technologies. The findings of this research bridge several research gaps, as outlined in section 2.5, contributing to the literature on subjective age and compensatory consumption while also offering actionable insights for marketers to enhance the allure of their technology services.

The following chapter presents the manuscript submitted to the *Journal of Service Research*.

## **Chapter 5. Is Technology the New Fountain of Youth?: Feeling Older Increases the Consumption of New Technologies**

### **5.1. Abstract**

The service industry is integrating new technology at a rapid pace. However, consumers do not always perceive substantial value in such innovations and are not fully embracing them, making it crucial for marketers to understand the factors that steer consumers' decisions to adopt these technologies. Drawing on existing literature on subjective age and compensatory consumption, it was proposed that when feeling older, consumers will gravitate toward new technology in an attempt to regain a sense of youthfulness. Three studies provide converging evidence supporting this proposal. Study 1 demonstrated that inducing an older subjective age increased participants' new technology adoption. Study 2 revealed that this effect is mediated by the perception that new technology will increase the sense of youthfulness. Further supporting the compensatory hypothesis, Study 3 showed that the focal effect diminished when participants were allowed an opportunity to restore their sense of youthfulness before making a choice. The findings of this research contribute to subjective age and compensatory consumption literature and provide practical implications for marketers to enhance the appeal of their technology services.

### **5.2. Introduction**

As technology evolves rapidly, the integration of new technology is on the rise in today's service industry. Hotels employ robots as front desk attendants, concierges, and AI chatbots for bookings (Kaye, 2022; Von Aue, 2023). Restaurants implement waiter robots and kiosks to address staff shortages (Gibbs, 2022; Tan, 2022; Wasserman, 2022). Museums leverage virtual and augmented reality to offer immersive experiences and NFT technology to host virtual exhibitions and facilitate artwork sales (O'Brien, 2023; Pogrebin, 2021). Despite the expectation that this trend will continue to grow (Globe Newswire, 2023), new technologies do not always appeal to consumers, making them slow to embrace them (Griffith, 2023; Kim,

2022; Westfall, 2022). Therefore, it is crucial to understand what motivates consumers to adopt new technology in a service context.

Consumers adopt new technologies because they anticipate fulfilling various needs through them (Davis et al., 1989; Parasuraman & Colby, 2015). Previous research has shown that consumers embrace new technologies to satisfy their functional needs, such as increased work efficiency and productivity (Davis, 1989; Venkatesh et al., 2003; Ziamou & Ratneshwar, 2002), as well as affective needs, including pleasure, arousal, enjoyment, psychological comfort, and stress relief (Kulviwat et al., 2007; Melamed & Pham, 2020; Rauschnabel, 2018). More central to our research, and an aspect that has received less attention, is that consumers also adopt new technologies to address self-related needs, such as impression management and self-expression (Kozinets, 2008; Rauschnabel, 2018). Importantly, the situation can trigger self-related motivations, leading to an increased intention to adopt new technology (Shalev & Morwitz, 2012).

The present research focuses on one such scenario in which consumers would be drawn to new technologies for self-regulation purposes. To explore this, we utilise the concept of subjective age, referring to how old or young one feels (Barak & Stern, 1986). Specifically, we investigate how a temporary increase in subjective age, thus feeling older than usual, influences new technology acceptance. According to the compensatory consumption literature (Mandel et al., 2017), consumers can alleviate the discomfort arising from discrepancies between their desired and actual selves through symbolic consumption. Our research argues that new technologies can serve as a symbolic means for consumers experiencing discrepancies between their ideal (youthful) and actual (old) age perceptions. Thus, we propose that a momentary increase in subjective age will lead to a greater preference for new technologies.

Our research makes several theoretical contributions. First, it adds to the literature on subjective age and its malleability. While earlier research regarded subjective age as a stable individual trait (Westerhof et al., 2003), recent research has revealed that subjective age is a flexible construct susceptible to situational influences (Mock & Eibach, 2011; Stephan et al., 2013) and have explored its downstream effects on consumer behaviour (Amatulli et al., 2018; Park et al., 2021). Nonetheless, there has been limited research on exactly how temporary shifts

in subjective age alter consumers' preferences and choices. Our research addresses this gap by establishing compensatory consumption as a unique underlying process.

Second, in prior research, feeling younger or older was typically associated with developmental and consumer outcomes commonly linked to the respective age groups (Amatulli et al., 2018; Wettstein et al., 2021). Numerous studies have shown that individuals tend to assimilate to the age they feel (i.e., an assimilation effect). However, our research demonstrates that feeling older increases the acceptance of new technologies, which are conventionally associated with younger age groups. Thus, we present a noteworthy exception to the existing literature by demonstrating that consumers can also behave in a manner contrary to the age they feel (i.e., a contrast effect).

Third, we enrich the compensatory consumption literature by introducing subjective age as a new source of self-discrepancy. In today's youth-oriented society that promotes an anti-ageing sentiment (Guiot, 2001; Twigg & Majima, 2014), consumers frequently grapple with a self-discrepancy between their ideal and actual age. However, despite its integral role in one's identity (George et al., 1980), the influence of age on eliciting compensatory responses has been largely unexplored. Thus, our work offers a timely contribution to the existing literature, complementing prior research that has investigated how self-discrepancies related to critical demographic variables, such as gender identity, can trigger compensatory consumption (White & Argo, 2009; Willer et al., 2013).

Fourth, our research extends the existing literature on technology and innovation consumption. Previous research has primarily focused on new technology consumption for its cognitive or functional benefits (Davis et al., 1989; Ziamou & Ratneshwar, 2002) or affective or hedonic advantages (Kulviwat et al., 2007; Melumad & Pham, 2020; Rauschnabel, 2018). However, the motivation to adopt new technologies for their symbolic benefits, which enable consumers to address their self-related needs, has received comparatively less attention (Rauschnabel, 2018; Wood & Hoeffler, 2013). We contribute to the breadth of this literature by demonstrating that consumers leverage the symbolic benefits of new technologies for self-regulation, thereby reconciling self-discrepancies related to age identity.

Fifth, our research contributes to the growing body of literature on the use of robots or

artificial intelligence (AI) in service contexts. Previous research has revealed how different individual characteristics and the types of AI used for robots influence consumer responses to robots in service contexts (Huang & Rust, 2021; McLeay et al., 2021; Pantano & Scarpi, 2022; Schepers et al., 2022). Few studies have focused on how situational factors affect consumer responses (Kim et al., 2021). Our research further enriches this literature by uncovering another condition that motivates consumers to respond favourably to services operated by robots or AI.

### **5.3. Theoretical Background**

#### **5.3.1. New Technology Consumption**

Researchers have conducted extensive investigations into understanding the determinants shaping consumers' decisions to adopt new technologies. According to the Technology Readiness Index (Parasuraman, 2000; Parasuraman & Colby, 2015), for example, new technology can elicit both positive and negative reactions, and it is the relative dominance of motivating and inhibiting factors that ultimately determines consumers' propensity to embrace new technologies. Other models (e.g., Davis et al., 1989) have similarly identified specific consumer beliefs and motivations that can enhance (e.g., perceived usefulness) or hinder (e.g., perceived risk) new technology adoption.

Despite some challenges in their adoption, new technologies have broad appeal for consumers as they satisfy various consumer needs by offering a wide range of benefits (Kozinets, 2008). These benefits can be categorised as follows. First, new technologies can provide utilitarian or functional benefits such as enhancing work efficiency and productivity (Davis, 1989; Venkatesh et al., 2003; Ziamou & Ratneshwar, 2002). Second, they offer emotional or hedonic benefits including pleasure, arousal, enjoyment, psychological comfort, and stress relief (Kulviwat et al., 2007; Melamed & Pham, 2020; Rauschnabel, 2018). Third, new technologies provide social benefits, such as aiding in the facilitation of connections with friends (Hadi et al., 2023; Rauschnabel, 2018). Fourth, and more central to our research focus, new technologies can also provide symbolic benefits, enabling the articulation of their youth, innovativeness, or status (Kozinets, 2008; Rauschnabel, 2018).

Consumers can leverage the symbolic benefits of new technologies to achieve their

desired self-view. In contemporary consumer life, advanced digital technologies have become an essential component that plays a pivotal role in consumers' self-expression (Murdock et al., 1995; Schau & Gilly, 2003). Consumers can embrace new technologies to signal their youth, coolness, creativity, and fashion (Kozinets, 2008), innovativeness (Rauschnabel, 2018; Shalev & Morwitz, 2012), status (Venkatesh & Davis, 2000), or leadership and professional success (Wood & Hoeffler, 2013). At times, the situation can trigger self-related motivations, leading to the intention to adopt new technology. For instance, Shalev & Morwitz (2012) demonstrated that observing individuals with lower social status using an innovative technology product could activate a desire to enhance one's self-image, subsequently increasing participants' inclination to purchase new technology products.

The present research focuses on one unique condition where consumers accept new technologies for their symbolic benefits to address their self-related needs. Specifically, we investigate how a momentary increase in subjective age (i.e., feeling older) impacts new technology consumption by stimulating a distinct motivation to regain a sense of youthfulness.

### **5.3.2. Subjective Age**

Subjective age indicates how young or old a person feels (Amatulli et al., 2018; Barak & Stern, 1986). It is correlated with one's chronological age but often diverges from it (Barrett, 2003; Kleinspehn-Ammerlahn et al., 2008). While some researchers prefer multi-item scales for measurement, a single-item scale, such as "How old do you feel now?" or "What age do you feel most of the time?" is generally used (Amatulli et al., 2018; Barrett, 2003; Mock & Eibach, 2011; Westerhof et al., 2003). Subjective age has traditionally been regarded as a stable individual trait (Westerhof et al., 2003). However, recent studies highlight its malleability, indicating daily fluctuations and shifts due to situational influences (Bellingtier & Neupert, 2019; Eibach et al., 2010; Kotter-Grühn et al., 2015).

Subjective age has important implications for development and consumer behaviour. Developmentally, feeling younger is linked with positive outcomes such as improved physical and mental health, increased life satisfaction, cognitive functioning, resilience to stress, and decreased mortality risk. On the other hand, perceiving oneself as older relates to adverse

outcomes in these areas (Debrezzeni & Bailey, 2021; Stephan et al., 2018; Westerhof & Barrett, 2005; Westerhof et al., 2014; Wettstein et al., 2021). In the context of consumer behaviour, individuals with a younger subjective age tend to exhibit increased sensation seeking (Stephens, 1991), engage more in fashion-related activities (Lin & Xia, 2012), and are more likely to opt for modern over traditional choices (Amatulli et al., 2018).

Recent research has revealed that subjective age is not just a stable trait but a malleable construct susceptible to situational influences. For instance, older adults may feel older after reading in low visual fluency conditions (Eibach et al., 2010) or taking a memory test (Hughes et al., 2013). Conversely, they may feel younger after receiving positive feedback on a hand-grip strength task (Stephan et al., 2013), imagining themselves in hedonic contexts (Guido et al., 2014), or envisioning the presence of younger individuals while shopping (Amatulli et al., 2018). Park et al. (2021) further demonstrated that subjective age can be temporarily increased for non-elderly individuals by having them compare themselves with someone younger or older.

A few studies investigated the downstream effects of these temporary shifts in subjective age. For instance, older adults who received positive feedback from a hand-grip strength test felt younger and performed better on a subsequent trial (Stephen et al., 2013). When made to feel younger, older adults preferred contemporary over traditional products (Amatulli et al., 2018). Moreover, feeling older increased prosocial behaviour among non-elderly adults due to a heightened sense of social responsibility (Park et al., 2021).

Overall, our review of prior research suggests that feeling younger or older is typically related to outcomes commonly associated with the respective age groups. That is, individuals tend to assimilate to the age they feel at the moment (i.e., an assimilation effect). To our knowledge, no research has yet investigated how subjective age prompts individuals to behave in a manner contrary to the age they feel (i.e., a contrast effect).

## **5.4. Current Research**

We propose that when consumers momentarily perceive themselves as older, they are more likely to opt for new technologies. This tendency can be attributed to their motivation to alleviate the discomfort derived from the self-discrepancy between their desired youthful and

perceived ageing identities.

Perceiving oneself as older can provoke unease as it involves assimilating the negative connotations associated with ageing. Modern consumer culture is youth-oriented and fosters an anti-ageing sentiment (Guiot, 2001; Twigg & Majima, 2014). People generally prefer youth over old age, a preference often stronger in implicit measures than explicit statements (Nosek et al., 2002). Ageing is frequently linked to negative stereotypes such as physical frailty and cognitive decline (Hummert et al., 2002; Perdue & Gurtman, 1990). Older adults are often considered intolerant, insecure, and unproductive (Rosencranz & McNevin, 1969). Aging also has negative social implications. People often prefer interacting with younger individuals (Levin & Levin, 1981). Employers tend to favour younger workers (Haefner, 1977). Consequently, feeling older can lead to a range of adverse psychological effects, such as reduced life satisfaction (Westerhof & Barrett, 2005), self-esteem (Barak & Stern, 1986), self-efficacy (Boehmer, 2007), perceived control (Shane et al., 2019), and optimism (Teuscher, 2009).

We expect that consumers will engage in strategic consumption when they feel older to cope with the negative implications tied to ageing. The literature on compensatory consumption suggests that the discrepancy between one's ideal and actual selves provokes discomfort, driving individuals to resolve these discrepancies (Mandel et al., 2017). Sometimes, consumers directly address the source of discomfort, for example, by joining a gym to lose weight and improve their appearance (Bagozzi & Dholakia, 1999; Schouten, 1991). At other times, they use symbolic self-completion, that is, engaging in actions that signal competence in the area of concern (Rucker & Galinsky, 2013; Wicklund & Gollwitzer, 1981). For example, consumers experiencing a low sense of power may opt for a pen associated with status (Rucker & Galinsky, 2008) or supersized food and drinks (Dubois et al., 2012) to restore their feelings of power. Similarly, individuals lacking control may choose brands with bounded (vs. unbounded) logos to regain a sense of control (Cutright, 2012).

We posit that consuming new technologies can serve as a symbolic self-completion strategy to recapture a sense of youthfulness. This connection is drawn from the fact that new technologies, or their adoption, are often characteristic of younger generations. First, there is a strong association between new technologies and younger generations. Individuals aged

between 18 and 34 make up the majority of early technology adopters (YouGov, 2020).

Younger workers are more likely to adopt new software systems than their older colleagues (Morris & Venkatesh, 2000). Furthermore, younger generations consist of the most active and dominant users of new technologies, such as mobile phones and metaverse, and they are often designed with the younger demographic in mind (BE Staff, 2022; Okazaki, 2008).

Second, consumers may use new technologies to signal their youth because doing so can indicate qualities characteristic of younger demographics. Younger individuals typically exhibit greater openness to experience (Srivastava et al., 2003), a penchant for novelty-seeking (Raju, 1980; Shoham & Pesämaa, 2013), and dispositional innovativeness (Midgley & Dowling, 1993; Steenkamp et al., 1999). In contrast, older individuals are often stereotyped as resistant to change and less capable of learning (Posthuma & Campion, 2009). Since new technologies continuously introduce novel features and upgrades, they require a certain level of openness to new information for adoption. Consequently, choosing new technologies could signal a youthful identity, as doing so aligns with attributes commonly associated with younger individuals.

Prior research suggests that consumers can appropriate the associations forged between specific products and their desired reference group by emulating their choice or behaviour (Englis & Solomon, 1995; Escalas & Bettman, 2003). Likewise, consumers who wish to reclaim a sense of youthfulness might consume new technologies to signal a younger identity. Formally stated:

**Hypothesis 1:** Consumers will exhibit an increased preference for new technology when they feel older than usual.

According to our compensatory hypothesis, consumers experiencing a sense of getting older are motivated to restore their youthfulness. This motivational state will change how consumers perceive new technologies, ultimately influencing their desire to engage with them. Prior research on compensatory consumption suggests that the state of self-discrepancy can alter the way consumers see certain products, causing them to perceive a greater potential from these products to help alleviate the aversive state (Dubois et al., 2010; Rucker & Galinsky, 2008, 2009; Sharma & Alter, 2012). For instance, Rucker & Galinsky (2009) demonstrated that

individuals in a state of low power naturally thought of luxury brands in terms of status, while the powerful did so in terms of performance. In a similar vein, people who felt powerless overestimated the value of monetary items (e.g., coins), which was a proxy for power (Dubois et al., 2010). Furthermore, they expected status-related items (e.g., an executive pen) to confer a greater sense of power (Rucker & Galinsky, 2008).

We expect feeling older to produce similar effects. Specifically, we anticipate that consumers experiencing a sense of ageing will be more inclined to view new technologies through the lens of age, perceiving greater potential for them to ameliorate their condition. Consequently, when feeling older, consumers will perceive new technology as conferring a stronger sense of youthfulness, leading to a greater desire to engage with it. Formally stated:

**Hypothesis 2:** The impact of feeling older on the inclination towards new technology will be mediated by consumers' perception of the youthfulness that new technology is expected to provide.

We have pointed to compensatory consumption as the underlying mechanism of the proposed effect. We expect consumers to choose new technologies when they feel older because they are motivated to resolve their age-related self-discrepancy. Prior research in compensatory consumption literature has demonstrated that allowing participants to alleviate their self-discrepancies before a primary choice task attenuates the compensatory consumption effect, as their needs are already satisfied. For instance, Gao et al. (2009) discovered that when consumers' firmly-held self-view (e.g., intelligence) is temporarily shaken, they are inclined to choose products that reinforce their original self-view (e.g., a fountain pen) over those that do not (e.g., a pack of M&M candies). Notably, this effect was reduced when participants were provided an opportunity for self-recovery before the primary choice (e.g., choosing intelligence-related magazines). Similarly, if our compensatory consumption hypothesis holds, allowing consumers to address their age-related discrepancies before the primary choice task will alleviate the focal effect. Formally stated:

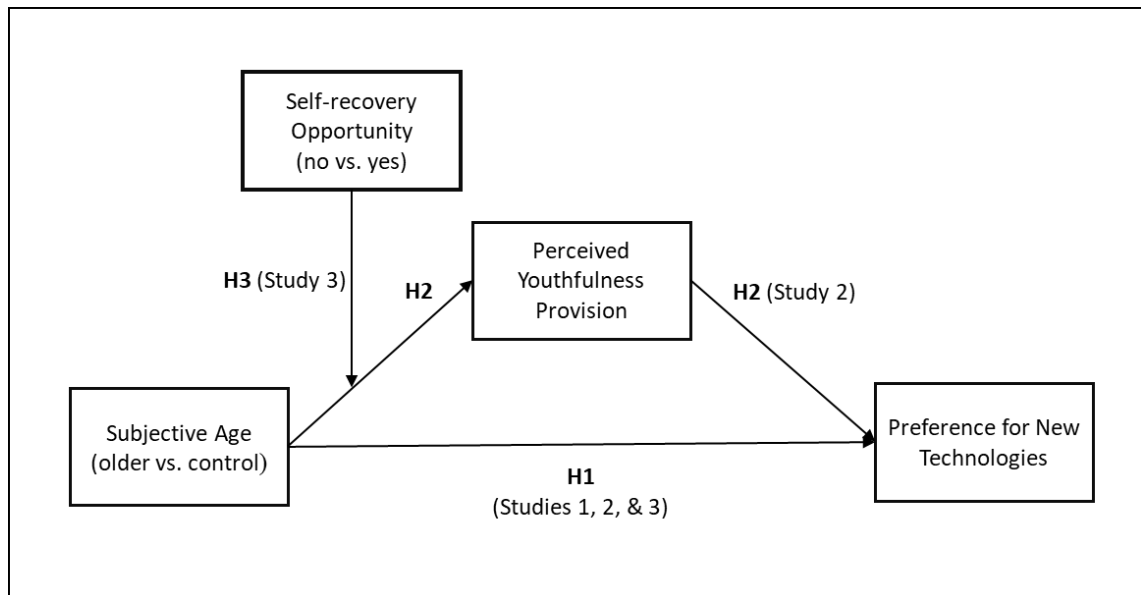
**Hypothesis 3:** The impact of feeling older on the preference for new technology will be mitigated when an opportunity to resolve age-related self-discrepancy is provided

before the choice task.

In the following sections, we detail three studies that test our hypotheses. Study 1 illustrates that a temporary increase in subjective age (i.e., feeling older) elevates a preference for new technologies. Study 2 delves into the underlying mechanism by assessing whether the primary effect is mediated by the expectation that the new technologies will foster a sense of youthfulness. Study 3 further verifies our conceptual model in line with prior research (Gao et al., 2009) by positing that the impact of subjective age will be mitigated if self-discrepancies are resolved before making a final decision. Figure 5.1 illustrates the overall theoretical framework of this research.

We pre-determined the sample size with the G\*Power program (Faul et al., 2007). Based on the criteria (i.e., effect size  $f = .25$ ,  $\alpha = .05$ ,  $1 - \beta = .90$ ), the minimum sample size per cell is 172. Thus, we aimed for at least 100 participants in each experimental condition. All data collection took place between October 2022 and September 2023. No participants participated in more than one study.

**FIGURE 5.1. Overall Theoretical Framework (Essay 1)**



## 5.5. Pilot Test

We conducted two preliminary tests to collect initial evidence supporting our assumption that consumers hold a cognitive association between new technology and younger

age and might utilise this connection to experience a sense of youthfulness. We pursued this objective in three distinct manners. First, we evaluated whether consumers associate new technologies with a younger age group. Second, we examined whether they perceive others who use new technologies as younger. Third, we explored whether they would be willing to engage with new technologies when motivated to feel younger.

In the first test (MTurk, N = 40), three questions were used to measure whether participants associated new technology with younger age (“Between the younger and older age groups, which one do you think is more closely associated with new technologies?” “Between the younger and older age groups, which one do you think is more interested in new technologies?” “Between the younger and older age groups, which one do you think is more actively consuming new technologies?” (1 = *definitely the older*, 4 = *no difference*, 7 = *definitely the younger*;  $\alpha = .78$ ). Another question assessed participants’ perceptions of others who use new technology (“All else equal, how would you perceive somebody who keeps up to date with new technologies in terms of age?” (1 = *definitely older*, 4 = *no difference*, 7 = *definitely younger*). As expected, participants associated new technology with the younger age group ( $M = 5.89$ ,  $SD = 1.08$ ;  $t(39)_{\text{differ from “4”}} = 11.03$ ,  $p < .001$ ) and indicated a tendency to perceive others keeping up with technologies as younger ( $M = 5.63$ ,  $SD = 1.03$ ;  $t(39)_{\text{differ from “4”}} = 9.98$ ,  $p < .001$ ).

In the second test (N = 40), we first assessed whether new technologies have the potential to make someone look younger. We compared smartwatches with analogue watches (“Which watch is more likely to make someone appear younger when worn?” (1 = *definitely an analogue watch*, 4 = *no difference*, 7 = *definitely a smartwatch*). Next, we specifically instructed participants to imagine feeling somewhat old and wanting to shake off those feelings. Then, we prompted them to indicate their choice while considering their aim to feel younger. Three questions asked participants to indicate which section in a department store they would be more inclined to explore (1 = *definitely “books,”* 4 = *no difference*, 7 = *definitely “tech & gadgets”*), which café they would be more inclined to choose (1 = *definitely a traditional café*, 4 = *no difference*, 7 = *definitely a robot-staffed café*), and which hotel they would be more inclined to choose (1 = *definitely a human-staffed hotel*, 4 = *no difference*, 7 = *definitely a robot-staffed*

hotel;  $\alpha = .82$ ). As expected, participants judged that a smartwatch holds a greater potential to make someone look younger than an analogue watch does ( $M = 6.15$ ,  $SD = 1.03$ ;  $t(39)_{\text{differ from "4"}} = 13.25$ ,  $p < .001$ ). Also, they indicated a stronger inclination to engage with new technologies when they intend to feel younger ( $M = 5.27$ ,  $SD = 1.59$ ;  $t(39)_{\text{differ from "4"}} = 5.05$ ,  $p < .001$ ).

Together, these results provide initial evidence supporting our proposition that technology is associated with younger age and consumers may use it as a means to restore a sense of youthfulness.

## **5.6. Study 1: Focal Effect**

Study 1 examined whether feeling older increases the intention to adopt new technology using a 2 (subjective age: older vs. younger) between-subjects design. We predicted that participants in the older subjective age condition would be more likely to adopt new technology than those in the younger subjective age condition. Study 1 used a robot-staffed hotel as a new technology. The use of robots has been increasingly popular in service contexts. Hotels use robots as front desk attendants, concierges, and AI chatbots for bookings (Kaye, 2022; Von Aue, 2023). Restaurants implement waiter robots and kiosks to fill the staff shortage (Tan, 2022). Major fast-food chains like Chipotle have employed robot chefs (Wasserman, 2022), and McDonald's introduced fully automated drive-through robots (Gibbs, 2022). This trend is expected to grow, providing a relevant and compelling context for our study.

### **5.6.1. Method**

We recruited 200 U.S. participants aged below 60 ( $M_{\text{age}} = 35.57$ ,  $SD = 7.77$ ; 59.0% female) from Amazon Mechanical Turk (MTurk) and randomly assigned them to one of 2 (subjective age: older vs. younger) between-subjects design.

First, we employed a writing task to manipulate participants' subjective age (adapted from Jiang et al., 2021). The older subjective age condition asked participants to list three things that make them feel old and elaborate on one of them for about a minute. Conversely, the younger subjective age condition asked participants to list three things that make them feel young and elaborate on one of them for about a minute.

Next, we administered the second and an ostensibly separate “preference survey.” We asked participants to imagine selecting a hotel for an upcoming trip. We presented them with two hotel options, a human-staffed and a robot-staffed hotel, with similar overall ratings. Pictures of robot or human staff were also provided to illustrate the two options (Kim et al., 2021; see Appendix A for study materials). As the key dependent variable, we had participants indicate their preference on a 7-point scale (“Which hotel do you prefer?”; 1 = *definitely prefer a human-staffed hotel*, 7 = *definitely prefer a robot-staffed hotel*).

We measured chronological age (“How old are you?”) and subjective age (“How old do you feel *right now*?”), from which we calculated a youth-age index by subtracting the latter from the former (Amatulli et al., 2018). A positive value in this index reflected the number of years respondents felt younger than their age, while a negative value indicated the number of years they felt older than their age. Finally, we collected demographic information, debriefed the participants, and dismissed them from the study.

### **5.6.2. Results**

As expected, a one-way ANOVA on the youth-age index revealed that participants in the older subjective age condition felt older ( $M = -4.63$ ,  $SD = 11.63$ ) than those in the younger subjective age condition ( $M = 1.70$ ,  $SD = 8.88$ ;  $F(1, 198) = 18.80$ ,  $p < .001$ ), indicating a successful manipulation.

A one-way ANOVA revealed a significant main effect of subjective age manipulation on the preference for the robot-staffed hotel ( $F(1, 198) = 8.50$ ,  $p = .004$ ). As predicted, participants exhibited a stronger preference towards the robot-staffed hotel when they felt older than younger ( $M_{older} = 2.78$ ,  $SD = 1.98$  vs.  $M_{younger} = 2.07$ ,  $SD = 1.42$ ). Thus, Study 1 offers preliminary evidence supporting our proposal that feeling older increases the adoption of new technology.

## **5.7. Study 2: Showing Process by a Mediation**

Study 2 had three objectives. First, we aimed to provide evidence to support our proposed explanation for why feeling older increases technology adoption. We hypothesised

that individuals who feel older are more inclined to perceive new technology as a means of restoring their sense of youthfulness, thereby resulting in increased adoption of new technology. To test this hypothesis, we will measure to what extent participants perceive the new technology as conferring a sense of youthfulness.

Second, we sought to clarify the nature of the effect by incorporating a control condition. Study 1 compared older and younger subjective age conditions, and thus the results were inconclusive regarding whether the effect was due to feeling older or younger. To determine whether the effect is primarily driven by feeling older, as hypothesised, this study will compare the older subjective age condition with the control condition.

Third, we wanted to test the robustness of the results of Study 1 by utilising a different approach to manipulate subjective age and employing a new technology, namely a virtual reality (VR) experience. A successful replication of the previous results will provide convergent evidence for the proposed impact of subjective age on technology adoption.

### **5.7.1. Method**

We recruited 242 U.S. adults ( $M_{\text{age}} = 40.14$ ,  $SD = 11.65$ ; 47.5% female) from MTurk and randomly assigned them to one of 2 (subjective age: older vs. control) conditions in a between-subjects design.

To manipulate subjective age, we asked participants to imagine attending their high school reunion. The scenario in the older subjective condition was as follows:

*Imagine that you attend your high school reunion. The event is held at your school. Upon arrival, you see the faces of your former classmates for the first time in a long time. You are immediately surprised to see that your friends look so young. And the more you talk to them, the more you realise they lead a more youthful life and have younger interests than you. Compared with them, you feel like you are an old person. Throughout the evening, you hear your friends telling each other, "Hey, you haven't aged a day!" But you don't hear that for yourself once in the entire evening!*

The scenario in the control condition was as follows:

*Imagine that you attend your high school reunion. The event is held at your school.*

*Upon arrival, you see the faces of your former classmates for the first time in a long time. You enjoy a good time at the event.*

A separate pretest ( $N = 100$ , MTurk) validated the effectiveness of this manipulation. After the imagination task, we measured chronological age (“How old are you?”) and subjective age (“How old do you feel *right now*?”), from which we calculated a youth-age index by subtracting the latter from the former (Amatulli et al., 2018). We conducted a one-way ANOVA on the youth-age index, using chronological age as a covariate, as we observed an unexpected chronological age difference ( $F(1, 98) = 2.90, p = .092$ ). As predicted, participants in the older subjective age condition reported feeling older ( $M = -3.57, SD = 10.44$ ) than those in the control condition ( $M = 3.71, SD = 10.42; F(1, 97) = 10.28, p = .002$ ).

Next, we asked participants to choose one of two exhibitions. One option was an art exhibition using new technology, described as “a new format of an art exhibition with the latest technology like virtual reality (VR), holography, and digital projection. The other option was a traditional art exhibition described as “a traditional format of an art exhibition” (see Appendix B for study materials). We measured relative preferences for the two options on a 7-point scale (“Which of the two art exhibition options would you choose?”; 1 = *definitely option A* (i.e., traditional art exhibition), 7 = *definitely option B* (i.e., an art exhibition with new technology).

Then, we used a two-item measure to assess the extent to which participants perceived that new technology would provide a sense of youthfulness (“Using new technology can make people feel younger” and “A person who uses new technology looks young”; 1 = *strongly disagree*, 7 = *strongly agree*;  $\alpha = .85$ ). Finally, we collected demographic information, debriefed participants, and dismissed them.

### **5.7.2. Results**

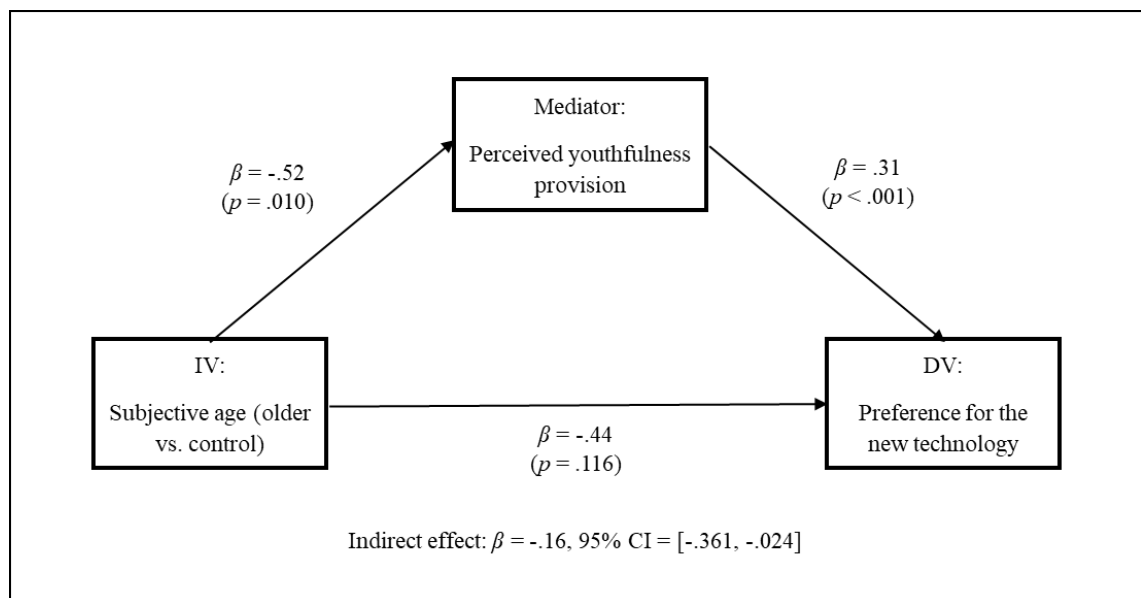
A one-way ANOVA revealed a predicted significant main effect of subjective age

manipulation ( $F(1, 240) = 4.57, p = .034$ ). As expected, participants exhibited stronger preferences towards the new technology option in the older subjective age condition ( $M = 4.87, SD = 2.10$ ) than in the control condition ( $M = 4.27, SD = 2.26$ ), providing further evidence for our focal effect.

A one-way ANOVA on perceived youthfulness provision revealed a significant effect of subjective age manipulation ( $F(1, 240) = 6.67, p = .010$ ). As predicted, participants perceived the new technology to provide a greater sense of youthfulness in the older subjective age condition ( $M = 4.56, SD = 1.54$ ) than in the control condition ( $M = 4.04, SD = 1.59$ ). We then used Hayes PROCESS macro model #4 with 5,000 bootstrapping to conduct mediation analysis (Hayes, 2018). The results revealed a significant indirect effect of perceived youthfulness provision (indirect effect =  $-.16, 95\% CI = [-.361, -.024]$ ). The direct effect was nonsignificant ( $c' = -.44, 95\% CI = [-.988, .109]$ ), suggesting a full mediation effect (Figure 5.2).

Study 2 further supports the proposed compensatory impact of feeling older on new technology consumption. Furthermore, it confirms our hypothesis that this effect is due to the perception that new technology provides a sense of youthfulness.

**FIGURE 5.2. Study 2 Results**



### 5.8. Study 3: Showing Process by a Moderation

The primary purpose of Study 3 is to provide further evidence for the underlying

mechanism by a moderation approach. We have pointed to compensatory consumption as the underlying mechanism of the proposed effect. That is, people choose new technology options because of their motivation to resolve a self-discrepancy arising from feeling older than they desire. Prior research has demonstrated that allowing participants to reduce their self-discrepancy can mitigate the compensatory consumption effect (Gao et al., 2009). Hence, Study 3 allowed participants an opportunity to recover their self before completing the primary choice task. We predict that providing this opportunity will eliminate the compensatory effect.

We determined the sample size for Study 3 based on the guidelines provided by Kim et al. (2023), who demonstrated that the necessary sample size for a moderation study can vary significantly depending on the expected pattern of the interaction effect. Specifically, this variation depends on whether researchers anticipate a weaker effect, no effect, or a reverse effect in the added conditions. In this study, we anticipated observing approximately a 15% difference in the proportion of participants choosing the new technology option when no self-recovery opportunity was available, whereas we expected to find no significant difference when self-recovery was present. Following the recommendations of Kim et al. (2023) led us to determine a sample size of 684, with 171 participants per condition. Consequently, we decided to collect a minimum of 200 participants for each condition.

### **5.8.1. Method**

We recruited 800 U.S. adults ( $M_{\text{age}} = 45.10$ ,  $SD = 13.72$ , 56.1% female) from MTurk and randomly assigned them to one of 2 (subjective age: older vs. control) x 2 (self-recovery opportunity: no vs. yes) between subject conditions.

The procedure resembled that of Study 2. First, we manipulated participants' subjective age using a scenario similar to that of Study 2. We revised the content slightly to keep an equivalent length between conditions. Specifically, participants in the older subjective age condition read:

*Imagine that you attend your high school reunion. Upon arrival, you see the faces of your former classmates for the first time in a long time. You are surprised that your*

*friends look much younger than you. And the more you talk to them, the more you realise they lead a more youthful life. Compared with them, you feel like you are an old person. You hear your friends telling each other, “Hey, you haven’t aged a day!” But you don’t hear that for yourself.*

On the other hand, participants in the control condition read:

*Imagine that you attend your high school reunion. Upon arrival, you see the faces of your former classmates for the first time in a long time. You are surprised to see that many people came. As you talk to them, you realise they have been waiting for this event. You have a good conversation with them.*

Before proceeding to the final choice, we provided participants with one condition: an opportunity for self-recovery. Specifically, we told them to imagine visiting a beauty supply store and purchasing anti-ageing skin care products that are known to work well. We did not give any additional information to the participants in the no self-recovery condition.

Subsequently, we asked participants to imagine meeting their cousin for coffee at one of two popular coffee shops and to indicate their preferred choice. One of the coffee shops featured a robot barista, whereas the other had a human barista (see Appendix C for study materials). We randomised the presentation order of the two options.

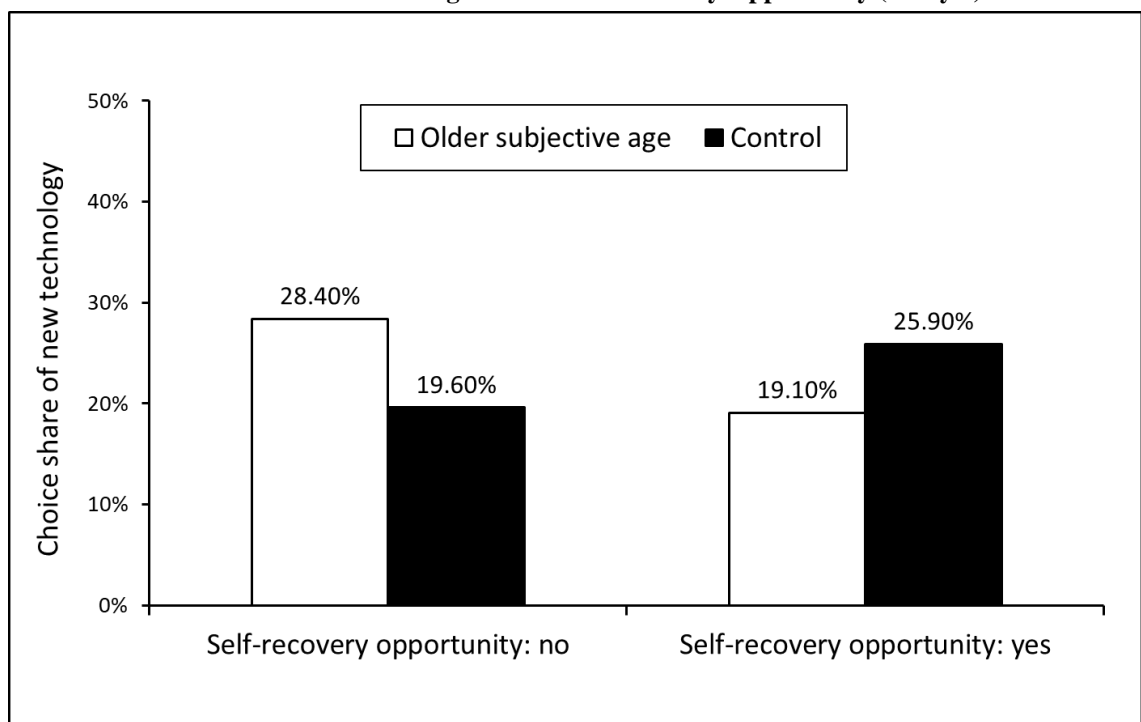
Then, we used a two-item measure to assess the extent to which participants perceived that new technology would provide a sense of youthfulness (“All else equal, people who stay current with recent technology seem younger than those who don’t” and “In general, the younger you are, the more you are interested in products or services using new technology”; 1 = *strongly disagree*, 7 = *strongly agree*;  $\alpha = .68$ ). Finally, we collected demographic information, debriefed the participants, and dismissed them.

### **5.8.2. Results**

We hypothesised that participants who felt older would be more likely to choose the

robot- than the human barista coffee shop, but only if they had not been allowed a self-recovery opportunity beforehand. A logistic regression revealed significant main effects of subjective age ( $B = -.49$ ,  $Wald(1) = 4.17$ ,  $p = .041$ ) and self-recovery opportunity ( $B = -.52$ ,  $Wald(1) = 4.69$ ,  $p = .030$ ), and, more importantly, a significant interaction effect ( $B = .88$ ,  $Wald(1) = 6.68$ ,  $p = .010$ ). In line with our prediction and consistent with the previous two studies, the choice of the robot-barista coffee shop was higher in the older subjective age condition (28.4%) than in the control condition (19.6%) when there was no self-recovery opportunity ( $Z = -.49$ ,  $p = .041$ ). However, when a self-recovery opportunity was presented, the choice of the coffee shop did not

**FIGURE 5.3. Moderating Effect of Self-recovery Opportunity (Study 3)**



differ regardless of subjective age manipulation ( $Z = 1.52$ ,  $p = .106$ ; see Figure 5.3).

Next, we conducted a two-way ANOVA on perceived youthfulness provision. The results revealed nonsignificant main effects of subjective age and self-recovery opportunity ( $p > .276$ ). However, there was a significant interaction effect ( $F(3, 796) = 7.92$ ,  $p = .005$ ). Planned comparisons showed that when there was no self-recovery opportunity, participants in the older subjective age condition ( $M = 5.00$ ,  $SD = 1.21$ ) perceived new technology as providing more youthfulness than participants in the control condition ( $M = 4.74$ ,  $SD = 1.21$ ;  $F(1, 796) = 4.74$ ,  $p = .035$ ). However, this pattern was reversed when the opportunity for self-recovery was

presented. Specifically, perceived youthfulness provision was slightly higher in the control condition ( $M = 4.89$ ,  $SD = 1.30$ ) than in the older subjective age condition ( $M = 4.66$ ,  $SD = 1.26$ ,  $F(1, 796) = 4.74$ ,  $p = .063$ ).

Finally, we conducted a moderated mediation analysis using the PROCESS macro (model 7; 5,000 bootstrap samples; Hayes 2018) to test whether perceived youthfulness provision mediated the interaction between subjective age and self-recovery opportunity. The results revealed a significant index of moderated mediation ( $B = .14$ ,  $SE = .07$ , 95% CI = [.033, .301]). Specifically, the indirect effect of subjective age on the choice of coffee shop through perceived youthfulness provision was significant when the self-recovery opportunity was absent ( $B = -.08$ ,  $SE = .04$ , 95% CI = [-.176, -.006]) but nonsignificant when the self-recovery opportunity was present ( $B = .07$ ,  $SE = .05$ , 95% CI = [-.005, .169]).

To summarise, Study 3 showed that feeling older increased the likelihood of choosing a new technology option, but this effect disappeared when participants had the opportunity to restore their self before their choice. These results further support the underlying mechanism of compensatory consumption using a moderation approach.

## **5.9. General Discussion**

### **5.9.1. Summary of Findings**

The present research investigated how momentary shifts of subjective age influence new technology consumption. We proposed that consumers will be more likely to gravitate towards new technology when they feel older, which is mediated by their expectation that such technology could invoke a sense of youthfulness. Three studies provided converging empirical evidence supporting our hypotheses. Study 1 demonstrated that feeling older increased the consumption of new technology. Study 2 provided evidence that this effect is mediated by the anticipation of regaining a sense of youthfulness through new technology. Further supporting our compensatory hypothesis, Study 3 demonstrated that the core effect diminished when we allowed participants an opportunity to restore feelings of youthfulness before the focal choice task.

### **5.9.2. Theoretical and Practical Contributions**

Our findings provide several theoretical contributions. First, our research adds to the burgeoning literature on the malleability of subjective age and its downstream effects. We expand the scope of the literature by highlighting the impact of temporary shifts in subjective age on consumer choice of new technology services (Amatulli et al., 2018; Park et al., 2021; Stephen et al., 2013). More importantly, our research unveils a unique mechanism through which momentary shifts in subjective age can change consumer behaviour. There has been a rising interest in the malleability of subjective age and its downstream effects, but limited research has been conducted to understand its underlying process. A notable exception was a study by Park et al. (2021), which found that feeling older enhances prosocial behaviour through a heightened sense of social responsibility. Our research fills this gap by demonstrating that feeling older can lead to increased new technology adoption as a compensatory response to mitigate the negative feelings associated with aging.

Second, our work distinguishes itself from prior research on subjective age, both within and beyond the realm of consumer research, which has generally shown that individuals tend to assimilate to the age they feel (i.e., an assimilation effect). That is, feeling younger or older has been typically related to developmental and consumer outcomes commonly associated with the respective age groups (Amatulli et al., 2018; Wettstein et al., 2021). For example, consumers with younger subjective age are more likely to engage in fashion-related activities (Lin & Xia, 2012) or choose contemporary over traditional products (Amatulli et al., 2018). Our research presents a noteworthy exception to this pattern by demonstrating that feeling older leads consumers to gravitate toward new technologies, which are conventionally associated with younger age groups. In essence, we have uncovered a contrast effect rather than an assimilation effect.

Third, we enrich the compensatory consumption literature by introducing subjective age as a unique driving factor. Earlier research has examined how critical demographic variables, such as gender identity, can trigger compensatory consumption (White & Argo, 2009; Willer et al., 2013). Yet, the role of age in prompting compensatory responses has not been examined, a surprising oversight considering how integral age, especially one's perception of it, is to one's

identity (George et al., 1980). As contemporary culture emphasises youth and endorses an anti-ageing ethos (Guiot, 2001; Twigg & Majima, 2014), consumers are more likely than ever to encounter a self-discrepancy between their desired and actual age. By demonstrating how situational shifts in subjective age can incite compensatory consumption, we make a timely contribution to the existing literature.

Fourth, the present research expands existing literature on technology and innovation consumption. Previous studies have focused mainly on consumers' perception of new technology from utilitarian or functional aspects (Davis et al., 1989; Ziamou & Ratneshwar, 2002) and hedonic or affective perspectives (Kulviwat et al., 2007; Melumad & Pham, 2020; Rauschnabel, 2018). However, the motivation to adopt new technologies based on their symbolic benefits to address self-related needs received less interest. Recent studies suggest that consumers use advanced technologies for impression management and self-expression, such as to feel a sense of importance or to project an innovative persona (Rauschnabel, 2018; Wood & Hoeffler, 2013). We build upon this literature by showing that adopting new technology can also be a strategy to reconcile self-discrepancies related to age identity, specifically the aspiration to appear younger.

Fifth, our research makes a valuable contribution to the growing body of literature on the use of robots or AI in service contexts. Previous studies have identified various types of AIs (e.g., mechanical vs. thinking vs. feeling) and their influence on consumer responses (Huang & Rust, 2021; Pantano & Scarpi, 2022; Schepers et al., 2022). Additionally, the degree to which robots resemble humans has been recognised as an important attribute (Blut et al., 2021; Murphy et al., 2019). However, relatively few studies have investigated when consumers respond favourably to robots or AI in service contexts (Kim et al., 2021; Shalev & Morwitz, 2012). Our research enriches this literature by uncovering another situational factor that facilitates the use of services operated by robots or AI, especially when consumers are uncomfortable with feelings of ageing and are motivated to feel younger.

Finally, the present work also offers valuable managerial implications. Our study revealed that even consumers with relatively younger chronological age are susceptible to a situational shift in subjective age. They may be particularly inclined to purchase technology

products or services while they perceive themselves as older than desired. To fully leverage the power of subjective age, marketers can employ strategies to evoke a subtle sense of age among their customers. For instance, incorporating cues that remind individuals of the passage of time, eliciting nostalgia, or highlighting the generational gap between older and younger cohorts may elicit a sense of feeling older. By creating marketing campaigns or product experiences that tap into these cues, marketers can align their offerings with consumers' desire to counteract the feeling of ageing, thereby enhancing the appeal of their technology products or services.

### **5.9.3. Limitations and Future Research**

Our research has limitations that offer several opportunities for future research. First, the present work has shown that the perception of one's age, specifically feeling older, can paradoxically increase the motivation to feel younger. However, this raises the question of whether perceiving oneself as older could potentially increase the likelihood of behaving in ways typically associated with older individuals. In essence, while our study indicates a contrast effect—feeling older leading to acting younger—there may be instances where an assimilation effect occurs, where feeling older leads to adopting older behaviours. Identifying the conditions under which the contrast or assimilation effect manifests is critical. One potential moderating factor in this relationship could be self-esteem. According to Stuppy, Mead, and Van Osselaer (2020), dual motives of self-enhancement and self-verification guide consumers' behaviour, and the level of self-esteem significantly influences which motive directs their consumption decisions. Whereas high self-esteem consumers choose superior products to boost their self-image, low self-esteem consumers choose inferior products that affirm their more pessimistic self-perception. Likewise, in contrast to our findings, consumers with lower self-esteem might shy away from advanced technologies when feeling old, favouring self-verification accounts. This suggests an exciting avenue for future research to examine the factors determining when subjective age results in assimilation versus contrast effects.

Second, future research may devise more pragmatic ways to shift subjective age subtly. In our studies, we asked participants to think and write about things that make them feel older (Study 1) or envision scenarios that made them feel older (Studies 2 and 3). Although these

methods successfully shifted participants' subjective age and demonstrated their impact on new technology consumption, they may not be easily transferrable to real-world marketing situations. For more tangible applications, subjective age manipulation should be performed more subtly. Prior research showed that contextual cues such as physical locations, social references, or product categories can influence subjective age (Guido et al., 2014). For instance, Amatulli et al. (2018) could subtly shift older adults' subjective age by incorporating images of younger individuals in their advertising. Future studies could explore alternative methods to subtly and effectively evoke a sense of ageing.

Third, future research could investigate whether the impact of momentary shifts in subjective age could vary across age groups. Particularly intriguing would be the examination of older consumers. The responses of older consumers to the sense of ageing may diverge from those of younger consumers. For instance, older consumers might be more predisposed to embracing their sense of age and might not actively counter such feelings. In such cases, a compensatory effect might not be evident. Additionally, it is plausible that among older consumers, feeling younger could be more likely to stimulate the adoption of new technology. While our study encompassed participants aged 19 to 85, the number of older individuals was relatively limited. This constraint makes it challenging to discern meaningful interactions within this age group. Thus, future research holds the potential to provide valuable insights into whether the impact of shifts in subjective age manifests differently for older consumers in this context.

Fourth, our study utilised new technological innovations that did not require extensive learning, such as a robot-staffed hotel, café, or a VR-powered exhibition. However, some high-tech products might be more challenging to master and demand a more extended learning period. We might not witness a compensatory effect for these products as they are more likely to reinforce feelings of oldness. Alternatively, such products may initially serve the purpose of symbolic self-completion but could gradually have the opposite effect if the individual fails to learn their use. 22% of consumers never learn how to use a high-tech product they receive as a gift, and consumers typically abandon their learning efforts after only 20 minutes of use (den Ouden et al., 2006; Walker, 2007). In such situations, these unused technology products can

remind one of one's inability to learn, thereby enhancing feelings of oldness. Future research may investigate how different technology product characteristics moderate subjective age's impact.

Finally, another interesting area for further research is the consumer use of self-service technologies (SSTs; Collier & Kimes, 2013; Van Beuningen et al., 2009; Weijters et al., 2007). Whether consumers view certain SSTs as new technology depends not only on product characteristics but also on several individual factors, such as their chronological age. For example, the same SSTs may seem newer to older consumers than younger ones. Consequently, for older consumers, using SSTs could serve as a means of regaining a sense of youthfulness when they experience discomfort from feeling older. As consumer adoption of SSTs is critical for service providers and consumers, this would be an interesting topic to explore.

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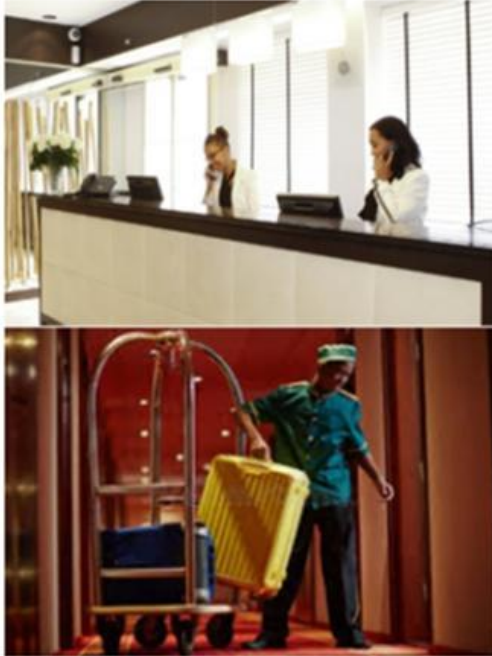
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**Appendix A. Study 1 Material**

**Option A:**  
**Human-Staffed Hotel**



**Option B:**  
**Robot-Staffed Hotel**



## Appendix B. Study 2 Material

### **Option A** **Traditional Art Exhibition**

A traditional format of an art exhibition



### **Option B** **Art Exhibition with Technology**

A new format of an art exhibition with the latest technology like virtual reality (VR), holography, and digital projection.



## Appendix C: Study 3 Material

**Human Barista Coffee Shop**



**Robot Barista Coffee Shop**



## Chapter 6. Prelude to Essay 2

There's a common belief that younger generations are leading the charge in sustainability efforts. Given the importance of encouraging greater consumer involvement in sustainable practices, this perception raises an interesting question: Can simply fostering a sense of youthfulness increase individuals' engagement in sustainable consumption, regardless of their actual age?

The subsequent chapter will introduce the second essay, titled "Feeling Younger and Acting Greener: The Impact of Subjective Age on Sustainable Consumption." This essay investigates how temporary shifts in subjective age affect sustainable consumption (RQ1), exploring its underlying mechanisms (RQ2) and potential boundary conditions (RQ3). Drawing on previous research on consumer identity and sustainable consumption, this study suggests that consumers are more inclined towards sustainable products when they feel younger, as these products better align with their activated youthful identity. The results of three controlled experiments lend support to this proposition. This research addresses various gaps outlined in section 2.5, contributing to the literature on subjective and sustainable consumption while also providing practical insights for practitioners to boost the sales of sustainable products.

The following chapter introduces the manuscript submitted to *Psychology & Marketing*.

## **Chapter 7. Feeling Younger and Acting Greener: The Impact of Subjective Age on Sustainable Consumption**

### **7.1. Abstract**

It is widely believed that younger generations are at the forefront of sustainability efforts. Given the significance of fostering greater consumer participation in sustainable consumption, this perception prompts an intriguing question: If consumers associate sustainability with younger individuals, can simply instilling a sense of youthfulness increase their engagement in sustainable consumption, regardless of their actual age? Building upon previous research on subjective age—i.e., how old one feels—and consumer identity, we propose that consumers will gravitate towards sustainable products when they feel younger than older. This is because such products align well with their perceived age identity, creating a perception of fit. The findings across three studies provide converging evidence that simply making consumers feel younger can result in an increased preference for sustainable products. Study 1 demonstrated that feeling younger increased the selection of more sustainable products over less sustainable ones. Study 2 showed that this effect is mediated by the perceived fit. Study 3 further supported the underlying mechanism by revealing that the focal effect was mitigated when the association between sustainability and younger age was weakened. This research provides valuable theoretical and practical implications.

### **7.2. Introduction**

Sustainability has become a paramount concern in today's global landscape, and younger generations are strongly interested in the sustainable movement. Gen Z (born roughly between 1997 and 2012) is often depicted in the media as the "sustainability generation" (Petro, 2021), with sustainability being their number one concern (Jahns, 2021). Compared to Gen X and Baby Boomers, Gen Z and Millennials (born roughly between 1981 and 1996) report having a greater concern for and taking more actions towards climate change (Tyson et al., 2021). Also, compared to Baby Boomers, Millennials are twice as willing to change their

consumption habits for the environment, such as paying a premium for products that feature sustainable ingredients or social responsibility claims and switching brands to purchase such products (NIQ, 2018).

This trend raises an interesting question. If younger individuals are more likely to engage in sustainable behaviours, would simply making consumers feel younger increase the likelihood of sustainable consumption regardless of their actual age? If so, why? To explore these questions, our research turns to the literature on subjective age, which refers to the age individuals feel and perceive themselves to be (Barak & Stern, 1986). Prior research has shown that having a lower subjective age (i.e., feeling younger) is associated with behaviours typically exhibited by younger individuals, such as showing more interest in fashion or new products (Lin & Xia, 2012; Stephens, 1991). Even a temporary activation of a younger age identity can prompt consumers to choose contemporary products over traditional ones (Amatulli et al., 2018). However, no research has examined the potential link between consumers' subjective age and sustainable consumption.

The present research investigates how a temporary decrease in subjective age influences consumers' preference for sustainable products. Building on prior research on consumer identity, which found that consumers are likely to be drawn to products that are consistent with their accessible identity (Aaker et al., 2001; Hong et al., 2000; Lau-Gesk, 2003; Shrum et al., 2013), we propose that even older consumers will prefer sustainable products when they perceive themselves as younger. This prediction is based on the premise that sustainability is more closely associated with younger than older individuals, thus creating a perceived fit between feeling younger and sustainable products.

Our research makes important theoretical contributions to the existing literature. First, it expands the subjective age literature in several ways. We build upon prior research connecting a younger subjective age with youthful behaviours (Amatulli et al., 2018; Lin & Xia, 2012; Stephens, 1991) and introduce sustainable consumption as an additional domain piqued when consumers feel younger. Also, while prior research has focused on the impact of feeling younger among older individuals (Amatulli et al., 2018), our research demonstrates that youthful feelings can influence adults of all ages. Furthermore, unlike previous research that did

not specify the mechanism through which a younger subjective age increases younger thoughts or behaviours, our research suggests perceived fit as the underlying mechanism, thus providing a more comprehensive understanding of subjective age's impact.

Second, we contribute to the literature on consumer identity and sustainable consumption by introducing subjective age as a unique driving factor. Previous research has focused on how a pro-environmental identity influences sustainable actions (Bartels & Hoogendam, 2011; Juhl et al., 2017; Van der Werff et al., 2014). However, our research focuses on consumers' age identity, which may initially appear unrelated to sustainability but can still influence their choice of sustainable products. Thus, we extend the literature on how identities seemingly unrelated to sustainability, such as gender, can impact sustainability (Brough et al., 2016).

The demand for sustainable practices is increasing in various sectors of society (Steffen et al., 2015). Marketing and consumer research are vital in implementing these practices, driving the transition toward a more sustainable economy (Kotler, 2011; Mick, 2006). By examining the role of subjective age, we offer a unique perspective that can contribute to advancing sustainability efforts in the consumer market.

## **7.3. Theoretical Background**

### **7.3.1. Subjective Age**

Subjective age, indicating how young or old a person feels (Amatulli et al., 2018; Barak & Stern, 1986), is essential to one's age identity (Kaufman & Elder Jr., 2002). Researchers typically measure subjective age using a single-item scale such as "How old do you feel now?" or "What age do you feel most of the time?" (Amatulli et al., 2018; Mock & Eibach, 2011). While people often feel older than their actual age in their early years, they feel increasingly younger than their actual age beyond their mid-twenties (Montepare & Lachmann, 1989; Rubin & Berntsen, 2006). This tendency to feel younger is a global phenomenon (Barak et al., 2001; Barak, 2009), and this trend intensifies with each passing year (Wettstein et al., 2023). The correlation between subjective and chronological age is surprisingly weak, ranging from .26 to .42 (Kastenbaum et al., 1972), suggesting the influence of various factors on one's self-

perceived age.

Several factors can influence subjective age. These include physical health (Mathur & Moschis, 2005; Westerhof et al., 2003), cognitive functioning (Hughes & Lachman, 2018), socio-demographic variables such as gender and marital status (Guido et al., 2018; Sherman et al., 2001), psychological factors such as one's future self-views (Kornadt et al., 2018), and behavioural factors such as media exposure (Mathur et al., 2014). Initially considered an individual trait stable over time and across situations, subjective age is now seen as a malleable construct varying with situational contingencies. It can fluctuate day-to-day according to daily health (Kotter-Grühn et al., 2015) or sense of control (Bellingtier & Neupert, 2020). Contextual influences are also important. For example, older adults felt younger when told they performed better than their same-aged peers on a hand-grip strength test (Stephan et al., 2013). Conversely, they felt older after reading in small, blurry fonts (Eibach et al., 2010) or engaging in memory tests (Hughes et al., 2013). More relevant to the marketing context, older adults felt younger after envisioning contexts associated with hedonic rather than utilitarian goals, such as physical locations, social references, or various product categories (Guido et al., 2014).

Subjective age carries significant implications. Generally, younger subjective age is associated with various benefits commonly related to youth. These include improved physical and mental health, cognitive function, life satisfaction, resilience to stress, and even a reduced risk of mortality for middle-aged and older adults (Debrecezeni & Bailey, 2021; Stephan et al., 2018; Westerhof & Barrett, 2005; Westerhof et al., 2014). In the marketing context, feeling younger is essentially associated with a tendency to think and behave similarly to younger people (Peluso et al., 2021). For example, those who feel younger tend to exhibit greater interest in fashion products (Lin & Xia, 2012) or new products (Stephens, 1991). Even momentary shifts toward a younger subjective age can prompt consumers to think and act as younger individuals would. For example, older adults preferred contemporary rather than traditional products (Amatulli et al., 2018) or performed better on a handgrip strength test (Stephan et al., 2013) when they felt younger. However, the precise underlying mechanisms connecting decreased subjective age and its downstream effects remain unclear. Table 7.1 provides an overview of prior research examining the malleability of subjective age and its downstream

effects.

**TABLE 7.1. Previous Research on Subjective Age’s Malleability and Downstream Effects**

Citation	Participants	IV	Key findings
Eibach et al. (2010)	Middle-aged and older adults	<ul style="list-style-type: none"> <li>Experiencing visual disfluency (vs. fluency; Studies 1 &amp; 2) or</li> <li>Generation gaps (vs. control; Study 3)</li> </ul>	<ul style="list-style-type: none"> <li>Participants felt older and, when primed with ageist stereotypes, more strongly endorsed age-stereotypic attitudes.</li> </ul>
Weiss & Lang (2012)	Older adults	<ul style="list-style-type: none"> <li>Exposure to negative (vs. positive or neutral) age stereotypes</li> </ul>	<ul style="list-style-type: none"> <li>Participants felt older.</li> </ul>
Hughes et al. (2013)	Older adults	<ul style="list-style-type: none"> <li>Subjective age measurement after (vs. before) memory test</li> </ul>	<ul style="list-style-type: none"> <li>Participants felt older.</li> </ul>
Stephan et al. (2013)	Older adults	<ul style="list-style-type: none"> <li>Receiving positive (vs. no) performance feedback on a handgrip strength task</li> </ul>	<ul style="list-style-type: none"> <li>Participants felt younger and performed better in the subsequent handgrip strength task</li> </ul>
Guido et al. (2014)	Older adults	<ul style="list-style-type: none"> <li>Contexts associated with hedonic (vs. utilitarian) goals</li> </ul>	<ul style="list-style-type: none"> <li>Participants felt younger.</li> </ul>
Amatulli et al. (2018)	Older adults	<ul style="list-style-type: none"> <li>The presence of younger (vs. older) individuals in a shopping context</li> </ul>	<ul style="list-style-type: none"> <li>Participants felt younger and were more likely to choose contemporary (vs. traditional) products.</li> </ul>
Geraci et al. (2019)	Older adults	<ul style="list-style-type: none"> <li>Subjective age measurement after (vs. before) cognitive tests</li> </ul>	<ul style="list-style-type: none"> <li>Participants felt older.</li> </ul>
Caspi et al. (2019)	All adults	<ul style="list-style-type: none"> <li>Subjective age measurement after (vs. before technology use)</li> </ul>	<ul style="list-style-type: none"> <li>Older participants felt older.</li> </ul>
Park et al. (2021)	Younger and middle-aged adults (18-60)	<ul style="list-style-type: none"> <li>Contrast with younger (vs. older) self or others</li> </ul>	<ul style="list-style-type: none"> <li>Participants felt older and engaged in more prosocial behavior.</li> <li>This effect was mediated by felt responsibility.</li> </ul>
Septianto & Kemper (2021)	All adults	<ul style="list-style-type: none"> <li>Contrast with younger (vs. older) others</li> <li>Message claim (altruistic vs. egoistic)</li> </ul>	<ul style="list-style-type: none"> <li>For altruistic claim, participants were more likely to choose organic option when feeling older; for egoistic claim, this effect was reversed.</li> <li>This effect was mediated by compassion and anger.</li> </ul>
Current research	All adults	<ul style="list-style-type: none"> <li>Writing about things that make them feel younger (vs. older)</li> </ul>	<ul style="list-style-type: none"> <li>Participants felt younger and were more likely to choose more (vs. less) sustainable products.</li> <li>This effect was mediated by perceived fit.</li> </ul>

Taken together, subjective age represents a promising yet relatively unexplored research area, providing a distinctive perspective for observing consumer behaviour. Our research seeks to investigate the influence of feeling younger within the context of sustainable consumption, targeting adults of all age groups and delving into the underlying mechanisms.

### 7.3.2. Sustainable Consumption and Identity

Sustainability is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987, p. 27). More specifically, it concerns the impact of human actions on the environment (Stern, 1997). A growing awareness that humans as decision-makers should carefully consider the environmental consequences has led to a more intention-oriented definition. From this perspective, sustainable behaviour can be best described as actions undertaken to benefit the environment (Stern, 2000). Within consumer research, sustainable behaviour often takes the form of sustainable consumption, such as purchasing green products over non-green products (Brough et al., 2016; Newman et al., 2014). Given the significant impact of consumption on sustainability, consumer research plays a crucial role in understanding and promoting sustainable practices.

Early research on sustainability in the marketing domain primarily focused on characterising the “green consumer” segment (Anderson & Cunningham, 1972). However, recent studies have shifted their attention toward exploring psychological and situational factors that drive sustainable consumption (Errmann et al., 2021; Kim et al., 2022; Trudel, 2018; White et al., 2019). Consumers’ identity, in particular, plays a crucial role in guiding sustainable actions. For instance, identifying oneself as an “organic consumer” or a “green consumer” can predict the purchase of organic products (Bartels & Hoogendam, 2011). Also, reinforcing a pro-environmental identity or engaging in sustainable behaviour at a given moment can increase the likelihood of similar actions in the future because people strive to act consistently with their self-concept (Juhl et al., 2017; Van der Werff et al., 2014). Sometimes, a self-concept unrelated to sustainability can also motivate sustainable consumption because consumers often associate such actions with specific traits. For example, the common cognitive association between environmental consciousness and femininity can lead male consumers to avoid eco-friendly options to preserve their masculine identity (Brough et al., 2016).

Taken together, identity serves as a significant factor in determining sustainable consumption. Sustainable behaviour is generally influenced by one’s self-identification as an environmentally conscious individual. However, limited evidence also suggests that identities

that may seem irrelevant to sustainability (e.g., gender identity) can impact sustainable behaviour. Our investigation aims to explore another scenario in which consumers' identity unrelated to sustainability influences sustainable consumption, namely age identity.

#### **7.4. Current Research**

The present research proposes that when consumers perceive themselves as younger, they are more likely to choose more sustainable options because such options align well with the activated younger age identity.

Identity plays a pivotal role in shaping and directing consumer behaviour, influencing a vast array of consumer decisions such as accessory selection (Berger & Ward, 2010), charity selection (Shang et al., 2008), office decor preferences (Gosling et al., 2002), and brand preferences (Escalas & Bettman, 2003). Among the multiple identities they possess, consumers are more likely to respond positively to stimuli that resonate with their currently accessible identities (Aaker et al., 2001; Hong et al., 2000; Lau-Gesk, 2003). Consumers are drawn toward products that reflect their identity because they innately seek coherence, meaning, and control (Heine et al., 2006; Swann, 2012). The desire to maintain positive self-views leads consumers to perceive identity-consistent information as more relevant than identity-inconsistent information (Wheeler et al., 2005). The consumption of products that align with one's identity may serve as a signal not only to others but also to themselves (Gosling et al., 2002; Shrum et al., 2013).

Building on this logic, we expect that feeling younger will motivate consumers to evaluate information consistent with a youthful identity more favourably. Existing research on subjective age supports this theory, suggesting that feeling younger can lead consumers to think and behave as younger individuals might (Peluso et al., 2021). Empirical evidence from past studies indicated a correlation wherein older consumers with lower subjective age are more likely to engage in purchasing behaviours typically associated with a younger demographic, such as an interest in fashion items (Lin & Xia, 2012) and newer products (Gwinner & Stephens, 2001; Stephens, 1991). Furthermore, Amatulli et al. (2018) showed that even momentary activation of a younger identity can increase the preference for contemporary products over traditional ones (e.g., a pen with a modern design vs. a traditional design) among

older adults.

The underlying premise of our proposal is that sustainable products are congruent with a youthful identity because there is a strong association between younger individuals and sustainability. This association is primarily based on the fact that younger people exhibit higher levels of environmental concern and engage in more sustainability-related actions than older people. Gen Z and Millennials demonstrate heightened concern for climate change and actively participate in climate action by discussing the issue, engaging with climate-related content on social media, and showing a willingness to make sacrifices, such as giving up fossil fuels and gas-powered cars (Tyson et al., 2021). Younger generations also have a greater inclination toward sustainable consumption. For instance, 75% of Millennials are willing to change their purchasing habits to favour eco-friendly products (NIQ, 2018). Similarly, compared to older generations, younger individuals are more willing to pay a premium for sustainable products and consider corporate sustainability contributions when making product or service choices (Yamane & Kaneko, 2021). The media further reinforces the association between younger individuals and sustainability by frequently highlighting this connection to consumers (e.g., Jahns, 2021; Petro, 2021; Ro, 2022).

We conducted a pilot test ( $N = 60$ , MTurk) to validate our assumption about the association between sustainability and younger age. Three questions measured whether participants associated sustainability with younger or older generations (e.g., “Between older and younger generations, who is more interested in purchasing sustainable products?”; 1 = *definitely older generations*, 4 = *no difference*, 7 = *definitely younger generations*;  $\alpha = .81$ ). As expected, sustainability was associated more strongly with younger than older generations ( $M = 5.67$ ,  $SD = 1.20$ ;  $t(59)_{\text{differ from “4”}} = 10.79$ ,  $p < .001$ ). Another test with a separate sample from the same population ( $N = 60$ ) revealed that, unlike sustainability, prosociality was more closely associated with older than younger generations (e.g., “Between older and younger generations, who is more interested in donating to charity?”; 1 = *definitely older generations*, 4 = *no difference*, 7 = *definitely younger generations*;  $\alpha = .78$ ;  $M = 3.37$ ,  $SD = 1.17$ ;  $t(59)_{\text{differ from “4”}} = -4.15$ ,  $p < .001$ ). These findings validate our assumption that sustainability is uniquely associated with younger age.

Interestingly, there is a discrepancy between the widespread belief that younger individuals are more actively engaged in sustainable behaviour and the mixed findings from research studies. While some studies have reported that younger individuals display greater environmental concern and are more likely to engage in sustainable practices (Hines et al., 1987; Jorgenson & Givens, 2014; Semenza et al., 2008; Yamane & Kaneko, 2021), other research has failed to identify a clear distinction based on age groups (Wiernik et al., 2013). The underlying reasons for this disparity remain unclear. However, lay beliefs may not be objectively true (Furnham, 1988), and we expect them to play a more significant role than factual evidence as they form the foundation for the cognitive associations about sustainability. Thus, we state the first hypothesis as follows:

**H1:** Consumers will prefer sustainable products when they feel younger compared to when they feel older.

We further propose that the perceived fit between consumers and the sustainable options drives the effect. The extent to which individuals perceive a product to align with their self-concept has been widely recognised as a key determinant of consumer behaviour (Sirgy, 1982). Consumers tend to choose products that they believe fit or match their self-image, as this compatibility provides a sense of authenticity and self-affirmation (Swaminathan et al., 2009). Perceived fit plays a vital role in consumer purchase decisions. For example, lonely consumers may choose minority-endorsed products because they feel that these products align with their feelings of loneliness in private consumption contexts (Wang et al., 2012). Similarly, consumers evaluate corporate social responsibility (CSR) efforts more positively when they perceive a stronger fit between their values or lifestyles and such activities (Lee et al., 2012). Additionally, consumers feel a stronger connection to brands associated with their ingroups compared to outgroups because they perceive a greater fit with these brands (Escalas & Bettman, 2005).

Therefore, we hypothesise that perceived fit will mediate the relationship between subjective age and the preference for sustainable products. Specifically, feeling younger is expected to increase the perceived fit with sustainable products, thereby increasing the likelihood of choosing such products.

**H2:** The effect of subjective age on the preference for sustainable products will be mediated by perceived fit.

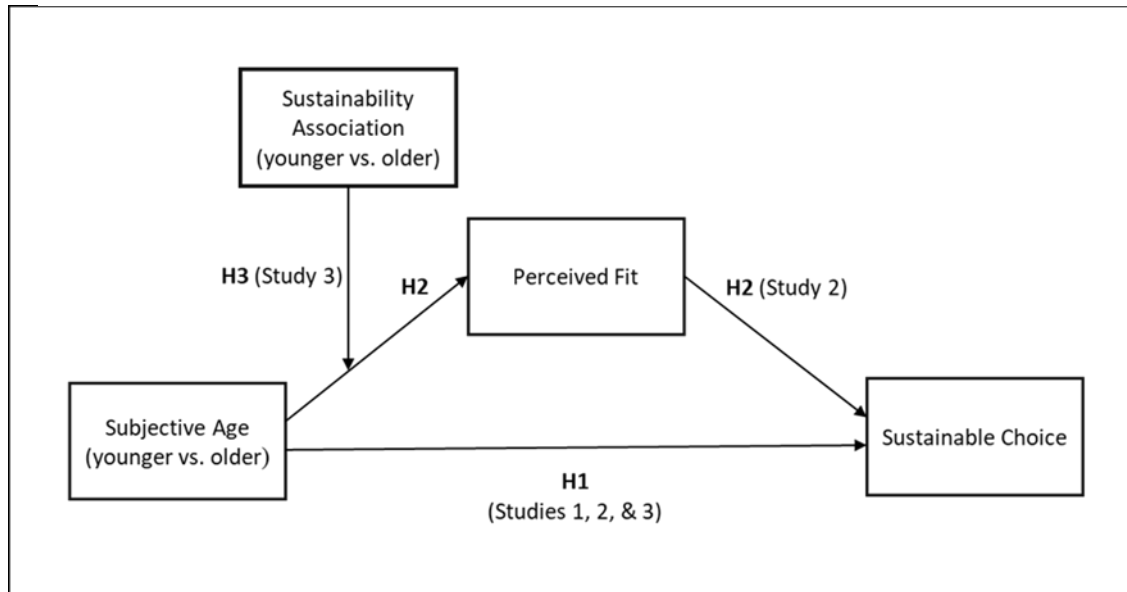
Our predictions were formulated based on the cognitive association between sustainability and the younger generation, enabling consumers to perceive a stronger alignment with sustainable products when they feel younger. If our argument holds, this effect should diminish when the link between sustainability and youth weakens. Without such association, feeling younger may not prompt consumers to perceive a fit with sustainable products, potentially limiting its impact on sustainable consumption. Indeed, in real-world scenarios, circumstances may arise where this connection wanes. For instance, if consumers discover that older individuals engage in pro-environmental behaviours as much as younger ones, it could weaken the mental association between youthfulness and sustainability. In such cases, consumers may not perceive sustainable products as congruent with their identity even when they feel youthful.

Study 3 tests this hypothesis by manipulating the strength of the association between sustainability and the younger generation. We predict that the effect of feeling younger will be evident when sustainability's association with the younger generation is strong but not when this association is weak.

**H3:** When the association strength between sustainability and youth is weak (vs. strong), the impact of feeling younger on the preference for sustainable products will be mitigated.

In the following sections, we detail three studies testing our hypotheses. Study 1 demonstrates that a temporary decrease in subjective age (i.e., feeling younger) increases the preference for more sustainable products over less sustainable ones. Study 2 delves deeper into the underlying mechanism, demonstrating that perceived fit mediates this effect. Study 3 further confirms our conceptual model by examining whether the positive impact of younger age identity is lessened when sustainability is weakly associated with younger generations. Figure 7.1 illustrates the overall theoretical framework of this research.

**FIGURE 7.1. Overall Theoretical Framework (Essay 2)**



We pre-determined the sample size with the G\*Power program (Faul et al., 2007). Based on the criteria (i.e., effect size  $f = .25$ ,  $\alpha = .05$ ,  $1 - \beta = .80$ ), the minimum sample size per cell is 64. Thus, we aimed for at least 80 participants in each experimental condition. Also, as we implemented a writing task to manipulate subjective age (Studies 2 & 3), we planned to exclude participants who provided nonsensical responses during the subjective age manipulation in the writing task (e.g., “Like, Nice, Well”), or who spent an unusually long time on the writing task, using a cut-off of five standard deviations from the mean (Catapano et al., 2022). All data collection was conducted between February 2023 and August 2023. No participants participated in more than one study.

## **7.5. Study 1: Focal Effect**

Study 1 examined whether feeling younger increases the choice of sustainable options using a 2 (subjective age: younger vs. older) between-subjects design. We predicted that participants in the younger subjective age condition would be more likely to choose sustainable options compared to those in the older subjective age condition.

### **7.5.1. Method**

We recruited 200 U.S. participants ( $M_{age} = 41.73$ ,  $SD = 12.41$ ; 53.5% female) from

Amazon Mechanical Turk (MTurk) and assigned them to one of 2 (subjective age: older vs. younger) between-subjects design.

We followed the protocol of Park et al. (2021) to manipulate subjective age. In the younger subjective age condition, we instructed participants to think of themselves when they would be 80 and compare that to who they are right now. In the older subjective age condition, we asked participants to think of themselves when they were 15 and compare that to who they are right now. A separate pretest ( $N = 80$ , MTurk) validated the effectiveness of this manipulation. We asked participants to indicate how young or old they felt (1 = *extremely young*, 100 = *extremely old*). As expected, participants in the younger subjective age condition reported feeling younger ( $M = 49.17$ ,  $SD = 19.27$ ) than those in the older subjective age condition ( $M = 60.10$ ,  $SD = 22.17$ ;  $F(1, 78) = 5.56$ ,  $p = .021$ ).

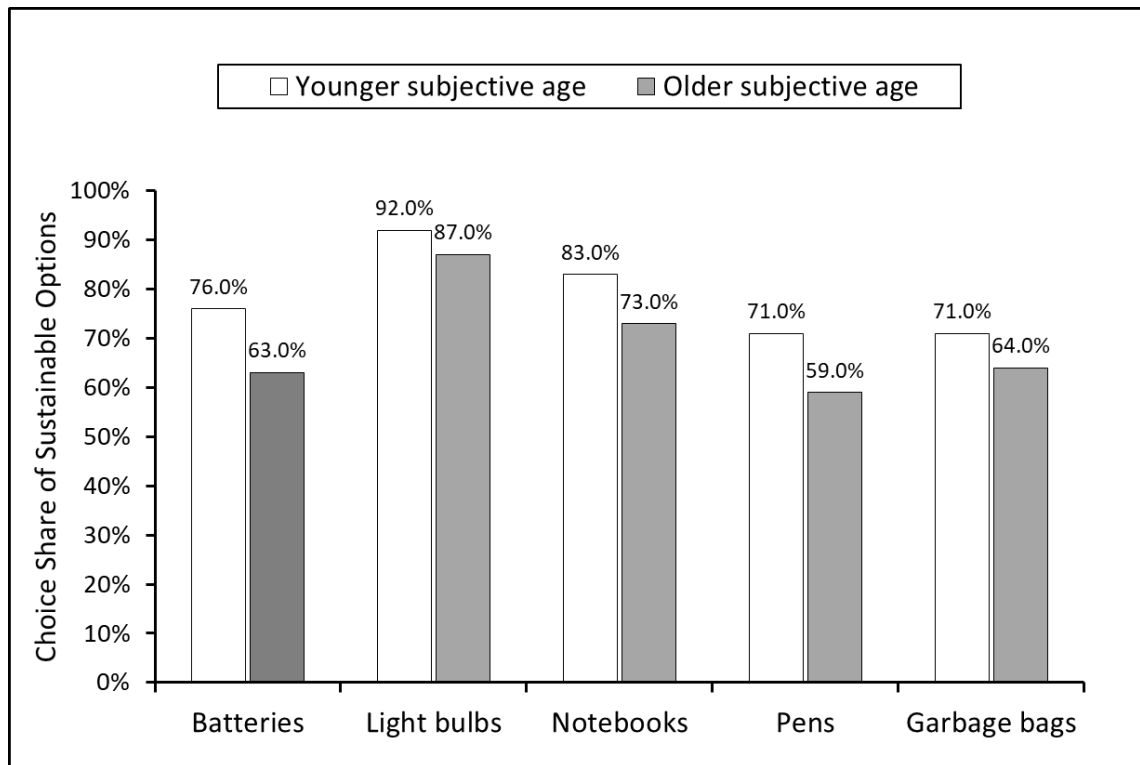
In the second part of the survey, we asked participants to imagine themselves grocery shopping and select their preferred options from five pairs of grocery items. The five product categories were batteries, light bulbs, notebooks (Yan et al., 2021), garbage bags, and pens. Each pair consisted of one option that was more sustainable and the other that was less sustainable (see Appendix A for stimuli). We randomised the presentation order of the five pairs as well as the order of the two options within each pair.

Finally, we collected demographic information, debriefed, and dismissed the participants.

### **7.5.2. Results**

We created an index of sustainable choice by adding the number of selected sustainable options, ranging from 0 to 5. A one-way ANOVA revealed a predicted significant main effect of subjective age manipulation ( $F(1, 198) = 5.65$ ,  $p = .018$ ). As expected, participants chose more sustainable options when they felt younger than older ( $M_{\text{younger}} = 3.93$ ,  $SD = 1.29$  vs.  $M_{\text{older}} = 3.46$ ,  $SD = 1.50$ ). Figure 7.2 illustrates the share of sustainable product choices within each product category.

**FIGURE 7.2. Study 1 Results**



Study 1 offers preliminary evidence supporting our proposal that a momentary shift in subjective age influences the choice of sustainable products. Specifically, participants demonstrated a greater tendency to choose sustainable products when they felt younger compared to when they felt older.

### **7.6. Study 2: Showing Process by a Mediation**

Study 2 had two objectives. First, we aimed to investigate the mediating role of perceived fit. We predict that the perceived fit will mediate the effect of feeling younger between consumers and sustainable products. Second, we sought to test the robustness of the findings from Study 1 by using a different manipulation of subjective age. Specifically, we employed a writing task, a method commonly used in previous research on consumer identity and mindset (e.g., Reed, 2004; Kim et al., 2019; Park et al., 2020). A successful replication of the previous results will provide convergent evidence for the proposed impact of subjective age on sustainable choice.

### 7.6.1. Method

We recruited 161 U.S. participants ( $M_{\text{age}} = 41.73$ ,  $SD = 12.41$ ; 53.5% female) from MTurk and randomly assigned them to one of 2 (subjective age: younger vs. older) between-subjects design.

First, we utilised a writing task to manipulate participants' subjective age. In the younger subjective age condition, we instructed participants to list three things that make them feel young and elaborate on one for about a minute. In the older subjective age condition, we instructed participants to list three things that make them feel old and elaborate on one for about a minute (adapted from Jiang et al., 2021).

A separate pretest ( $N = 120$ , MTurk) validated the effectiveness of this manipulation. After the writing task, we measured both chronological age ("How old are you?") and subjective age ("How old do you *feel* right now?). Then, we created a youth-age index by subtracting subjective age from chronological age, such that the value in the youth-age index indicates how many years the respondent felt younger than their actual age (Amatulli et al., 2018). A one-way ANOVA confirmed that participants in the younger subjective age condition felt younger ( $M = 5.58$ ,  $SD = 10.23$ ) than those in the older subjective age condition ( $M = .40$ ,  $SD = 13.25$ ;  $F(1, 118) = 5.75$ ,  $p = .018$ ). For further validation, we also measured subjective age by asking participants to indicate how young or old they felt on a 100-point scale (1 = *extremely young*, 100 = *extremely old*; Park et al., 2021). As expected, a one-way ANOVA confirmed that participants in the younger subjective age condition felt younger ( $M = 40.37$ ,  $SD = 16.10$ ) than those in the older subjective age condition ( $M = 53.63$ ,  $SD = 15.59$ ;  $F(1, 118) = 21.02$ ,  $p < .001$ ).

Next, we administered dependent and mediator measures. As in Study 1, we asked participants to choose between more and less sustainable options for five different product categories. We randomised the presentation order of the five pairs as well as the order of the two options within each pair. Then, we asked participants to respond to a one-item measure of perceived fit ("Sustainable products are a good fit for me"; 1 = *not at all*, 7 = *very much*; adapted from Ostinelli & Luna, 2022).

Finally, we collected demographic information, debriefed the participants, and

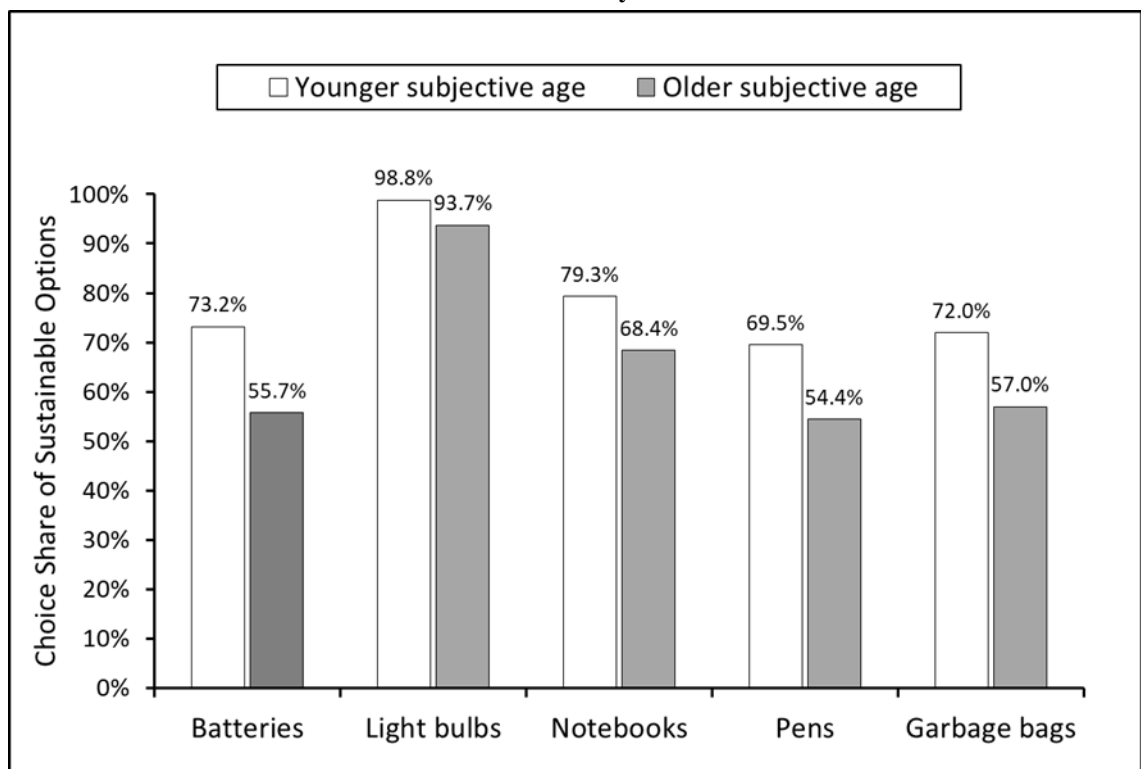
dismissed them from the study.

### 7.6.2. Results

We excluded one participant who took an unusually long time during the writing task using a cut-off of five standard deviations from the mean. After exclusions, we had a final sample of 160 participants ( $M_{age} = 39.58$ ,  $SD = 12.37$ ; 60.6% female).

As in Study 1, we created an index of sustainable choice by adding the number of selected sustainable options ranging from 0 to 5. A one-way ANOVA on sustainable choice revealed a significant main effect of subjective age manipulation ( $F(1, 158) = 8.43$ ,  $p = .004$ ). As expected, participants chose more sustainable options when they felt younger than older ( $M_{younger} = 3.93$ ,  $SD = 1.39$  vs.  $M_{older} = 3.28$ ,  $SD = 1.42$ ), replicating the results of Study 1. Figure 7.3 illustrates the share of sustainable product choices within each product category.

**FIGURE 7.3. Study 2 Results**



A one-way ANOVA on perceived fit revealed a marginally significant effect of subjective age manipulation ( $F(1, 158) = 3.05$ ,  $p = .083$ ). As predicted, participants perceived greater fit in the younger subjective age condition than in the older subjective age condition ( $M_{younger} = 5.57$ ,  $SD = 1.26$  vs.  $M_{older} = 5.22$ ,  $SD = 1.32$ ). We then used Hayes macro #4 with

5,000 bootstrapping to conduct a mediation analysis. The results revealed a marginally significant indirect effect of perceived fit ( $a \times b = -.27$ , 90% CI = [-.52, -.02]). The direct effect remained significant ( $c' = -.38$ , 90% CI = [-.65, -.11]), suggesting a partial mediation effect.

Therefore, Study 2 replicated the results of the first study and confirmed our hypothesis that the perceived fit between consumers and sustainable options drives this effect.

### **7.7. Study 3: Showing Process by a Moderation**

Study 3 aims further to substantiate the underlying mechanism through a moderation approach. In Studies 1 and 2, we demonstrated that feeling youthful enhances the preference for sustainable products, as consumers perceive a greater fit with such products. This effect is predicated on the assumption that consumers link sustainability with the younger generation. Thus, when this association is weak, feeling younger will not lead consumers to perceive a better fit with sustainable products, which could limit its influence on sustainable consumption. Study 3 tests this hypothesis by manipulating the strength of the association between sustainability and younger age. We predict that the impact of feeling younger will be replicated when the association is strong but not weak.

#### **7.7.1. Method**

We recruited 400 U.S. participants ( $M_{\text{age}} = 41.64$ ,  $SD = 12.62$ ; 56.3% female) from MTurk and randomly assigned them to one of 2 (subjective age: younger vs. older)  $\times$  2 (association strength: stronger vs. weaker) between-subjects design.

After manipulating participants' subjective age through the writing task, as described in Study 2, we administered the "preference survey." This survey presented a photo of sustainable batteries (Energizer Eco Advanced) made with recycled materials. To manipulate association strength, we included a graphic chart alongside the photo, displaying the sales distribution of the batteries by age group. In the stronger association condition, the chart showed that the youngest age group (ages 18-34) accounted for 51% of the sales distribution, while the other two age groups (ages 35-54 and 55+) accounted for 25% and 24%, respectively. In the weaker association condition, the chart was reversed, with the oldest age group (ages 55 and above)

accounting for 51% of the sales distribution, while the other age groups accounted for 25% and 24%, respectively (See Appendix B for study material). Then, we measured participants' purchase intention for the sustainable batteries in comparison to the regular batteries of the same brand ("How likely would you be to choose Energizer Eco Advanced instead of regular Energizer batteries?"; 1 = *not at all*, 7 = *very much*).

Lastly, we administered a manipulation check for association strength ("Which generation do you most strongly associate Energizer Eco Advanced with?"; 1 = *definitely the older generation*, 7 = *definitely the younger generation*). As a manipulation check for subjective age, we also asked participants to indicate how old they felt on a 100-point scale (1 = *extremely young*, 100 = *extremely old*). We then collected demographic information, debriefed the participants, and dismissed them from the study.

### 7.7.2. Results

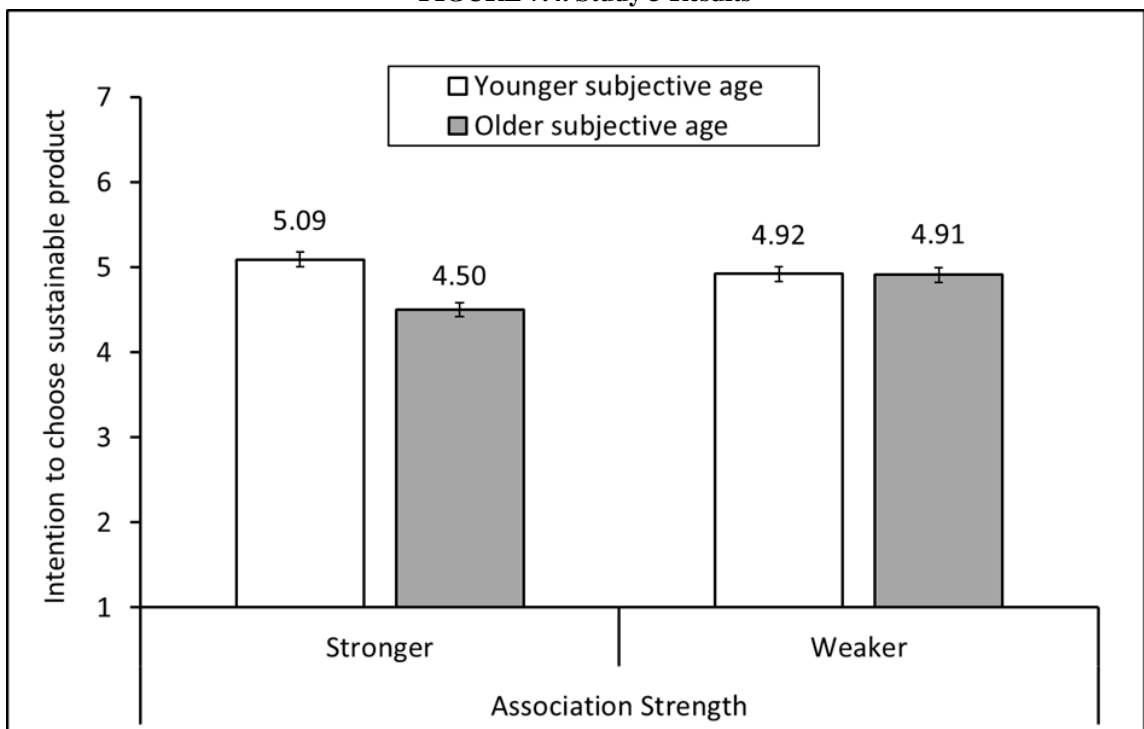
We excluded seven participants who wrote nonsense responses to the writing manipulation of subjective age and three who took an unusually long time during the writing task using a cut-off of five standard deviations from the mean. After exclusions, we had a final sample of 390 participants ( $M_{\text{age}} = 41.69$ ,  $SD = 12.70$ ; 56.2% female).

A two-way ANOVA on subjective age measure revealed a main effect of subjective age manipulation ( $F(3, 386) = 16.19$ ,  $p < .001$ ). As expected, participants in the younger subjective age condition felt younger than those in the older subjective conditions ( $M_{\text{younger}} = 39.95$ ,  $SD = 17.01$  vs.  $M_{\text{older}} = 48.56$ ,  $SD = 18.69$ ), indicating a successful manipulation. There was also an unexpected significant interaction effect ( $F(3, 386) = 3.90$ ,  $p = .049$ ), indicating a stronger impact of subjective age when association strength was weaker ( $F(1, 191) = 20.63$ ,  $p < .001$ ) than when it was stronger ( $F(1, 195) = 4.54$ ,  $p = .034$ ).

Next, a two-way ANOVA on association strength revealed only a main effect of association strength ( $F(3, 386) = 119.47$ ,  $p < .001$ ), indicating a successful manipulation. As expected, participants in the stronger association condition more strongly associated sustainability with the younger generation ( $M = 5.64$ ,  $SD = 1.06$ ) than those in the weaker association condition ( $M = 4.22$ ,  $SD = 1.48$ ).

For the main analysis, a two-way ANOVA on the intention to choose the sustainable batteries revealed a marginally significant main effect of subjective age ( $F(3, 386) = 3.28, p = .071$ ). Participants in the younger subjective age group exhibited a higher intention to choose the sustainable batteries than those in the older subjective age group ( $M_{\text{younger}} = 5.00, SD = 1.59$  vs.  $M_{\text{older}} = 4.70, SD = 1.67$ ). More importantly, the analysis revealed a marginally significant interaction effect ( $F(3, 386) = 3.03, p = .082$ ). Consistent with our prediction, planned comparisons revealed that when sustainability was strongly associated with the younger generation, participants in the younger subjective age group reported higher intention to choose sustainable batteries than those in the older subjective group ( $M_{\text{younger}} = 5.09, SD = 1.56$  vs.  $M_{\text{older}} = 4.50, SD = 1.68, F(1, 386) = 6.38, p = .012$ ). When sustainability was weakly associated with the younger generation, however, the intention to choose the sustainable batteries did not differ between the two subjective age groups ( $p = .962$ ; see Figure 7.4).

**FIGURE 7.4. Study 3 Results**



Study 3 confirmed the hypothesis that the influence of feeling younger on sustainable consumption would diminish when the association between sustainability and younger age is weakened. Therefore, it further supports our proposition that feeling younger enhances the likelihood of sustainable consumption through the perception of a greater fit.

## **7.8. General Discussion**

### **7.8.1. Summary of Findings**

The present research investigated how momentary shifts of subjective age influence sustainable consumption. We proposed that consumers are more likely to gravitate towards sustainable products when they feel younger compared to when they feel older. Additionally, we suggested that the perceived fit between consumers and sustainable products mediates this effect. Three studies provided converging empirical evidence in support of these hypotheses. Study 1 demonstrated that activating a younger subjective age increased the preference for sustainable products over regular products. Study 2 proved that the perception of fit between consumers and sustainable products mediated this effect. Furthermore, supporting our theoretical account that feeling younger increases the preference for sustainable products due to the association between youth and sustainability, Study 3 showed that the primary effect diminished when the association strength between sustainability and younger age weakened.

### **7.8.2. Theoretical and Practical Contribution**

Our research makes significant contributions both theoretically and practically. First, previous research has indicated that a younger subjective age can lead to the adoption of thoughts or behaviours commonly related to younger consumers, such as an increased interest in fashion or new products (Amatulli et al., 2018; Gwinner & Stephens, 2001; Lin & Xia, 2012). We extend this line of research by introducing sustainable products as another category associated with younger consumers and thus benefit from feeling younger.

Second, we contribute to the existing literature by elucidating the role of perceived fit as the underlying process that connects shifts in subjective age and sustainable consumption. Prior research has offered limited insights into how feeling older or younger influences consumer behaviour. Earlier studies have identified perceived responsibility towards society, stemming from age-related lay beliefs, as one mechanism through which feeling older impacts consumer behaviour (Park et al., 2021; Septianto & Kemper, 2021). In contrast, while previous research has shown that feeling younger leads to behaviours often associated with younger individuals (Amatulli et al., 2018; Stephan et al., 2013), no empirical tests have explored the underlying

mechanism. Thus, by providing the first empirical evidence of the underlying mechanism connecting feeling younger to its downstream effects, our research makes a meaningful contribution to the current literature on the malleability of subjective age.

Third, prior research on the malleability of subjective age and its downstream effects has mainly focused on older consumers, examining how making them feel younger changes their behaviour (Amatulli et al., 2018). This focus is understandable because older consumers have more room to feel younger compared to younger consumers. However, by demonstrating the relationship between feeling younger and sustainable consumption from consumers from all age groups, we show that the influence of feeling younger extends beyond specific age demographics.

Fourth, we contribute to the literature on consumer identity and sustainable consumption by introducing subjective age as a unique driving factor. Previous research has primarily focused on how a pro-environmental identity influences sustainable actions. It has been shown that consumers with a stronger sustainable identity are more likely to engage in sustainable behaviours (Bartels & Hoogendam, 2011). Additionally, it has been found that reinforcing a pro-environmental identity or engaging in sustainable actions can increase the likelihood of future sustainable behaviours (Juhl et al., 2017; Van der Werff et al., 2014). Only a small body of research has demonstrated how self-concepts seemingly unrelated to sustainability, such as gender, can still influence sustainable consumption (Brough et al., 2016). In line with this, our research found that age identity can substantially impact the preference for sustainable products. This finding contributes to the existing body of knowledge that connects consumers' identity with their engagement in sustainable consumption.

Fifth, our research findings provide valuable insights for marketers and policymakers, highlighting a strategic opportunity to capitalise on the relationship between younger subjective age and the preference for sustainable products. Marketers can utilise these insights to tailor their marketing strategies effectively. By creating campaigns that evoke feelings of youthfulness, companies have the potential to enhance the appeal and consumption of green products. Retail environments, whether physical or online, could be designed to evoke a youthful ambience. Companies can subtly guide consumers towards choosing green products

over non-green alternatives by providing a shopping experience that resonates with younger perceived age. Our findings offer policymakers a fresh perspective on promoting environmentally friendly behaviours. Public campaigns could be reframed to evoke a sense of youthfulness to encourage sustainable behaviours. By tapping into the mindset associated with youthfulness, businesses and policymakers can potentially increase the adoption of sustainable products and practices, contributing to broader environmental objectives.

### **7.8.3. Limitations and Future Research**

Our research also has limitations. First, the present research found that feeling younger increases the preference for sustainable products. Initially, our findings may appear contradictory to Park et al. (2021), who found that feeling older increases engagement in prosocial actions. They attributed this effect to the heightened sense of responsibility for the well-being of distant others arising from societal norms that emphasise the responsibility of older adults to contribute to the greater good.

There are at least two reasons for the divergent findings. To begin with, as our pilot test showed, consumers maintain distinct cognitive associations about sustainable and prosocial behaviours. Specifically, they associate sustainability more closely with younger generations and prosociality with older generations. Despite some overlapping features, the two behaviours represent distinct constructs: prosocial behaviours are carried out to benefit other individuals (Gentile et al., 2009), while sustainable behaviours aim to benefit the environment (Stern, 2000). Also, different factors influence an individual's inclination towards each of these behaviours (Dahl & Brown, 2019; Flook et al., 2015; Schultz, 2001), and different motivations drive consumers to engage in them (Mostafa, 2007; Septianto & Soegianto, 2017). The distinct nature of these two concepts allows for unique associations to develop.

Relatedly, this difference may have been more pronounced by contextual differences between the studies. The studies conducted by Park et al. (2021) focused on scenarios involving charitable donations, where participants were initially provided with information about a charity and then asked about their willingness to contribute their resources. This context is likely to have heightened the accessibility of moral concerns, which form the foundation of prosocial

behaviour (Septianto & Soegianto, 2017). Consequently, feeling older would have a greater chance of activating lay beliefs associated with social responsibility. On the other hand, our studies examined a typical consumer purchasing situation, where participants were asked to choose a product for personal use. This context is less likely to have evoked a sense of societal responsibility, allowing the influence of self-concept as younger or older individuals to be more prominent. Therefore, sustainable options would have been perceived as more aligned with the younger age identity of the participants rather than fulfilling societal obligations. It would be valuable for future research to systematically investigate these contextual differences and their impact on the relationship between subjective age, prosocial behaviour, and sustainable behaviour.

Second, future research could explore more ecologically valid approaches to manipulate subjective age. In our studies, we employed techniques such as asking participants to think about being very old (vs. very young) and comparing it to their current self (Study 1), as well as writing about things that make them feel younger or older (Studies 2 and 3). While these methods effectively shifted participants' subjective age and proved helpful in identifying the impact of feeling younger, they may not be readily applicable in real-world marketing settings. To achieve more tangible applications, subjective age manipulation should be conducted more subtly. For example, Amatulli et al. (2018) incorporated images of younger or older individuals in advertising, which could subtly shift the subjective age among older adults. Future studies could explore alternative methods that similarly and effectively evoke feelings of increased age more subtly, considering the practicality and feasibility in marketing contexts.

Third, future research should investigate the boundary conditions of our findings. While our research indicates that feeling younger increases the preference for sustainable products, examining this effect across different types of sustainable behaviours would be valuable. For example, recycling is a form of sustainable behaviour, and previous studies have found that older adults are more inclined to engage in it. Therefore, if our identity-based explanation holds, we may observe a diminished or even reversed effect regarding recycling when individuals feel younger. On the other hand, climate justice may resonate more strongly with younger individuals, leading to larger effects of feeling younger on such types of sustainable behaviours.

Exploring these potential differences could provide a more nuanced understanding of how subjective age influences sustainable behaviour and shed light on the boundary conditions of our findings.

Fourth, it would be intriguing for future research to investigate how the association between youth and sustainability extends to perceptions of brand image or marketing messages. For example, would a brand's active involvement in sustainable practices and promotions lead to a perceived "younger" brand image? Furthermore, future studies could examine whether sustainable marketing strategies that incorporate youthful elements, such as vibrant imagery, trendy language, and the use of influencers popular among younger audiences, enhance the fluency and appeal of the message. Such investigations could offer valuable insights for brands seeking to position themselves as appealing to a youthful demographic and effectively promote their sustainability initiatives.

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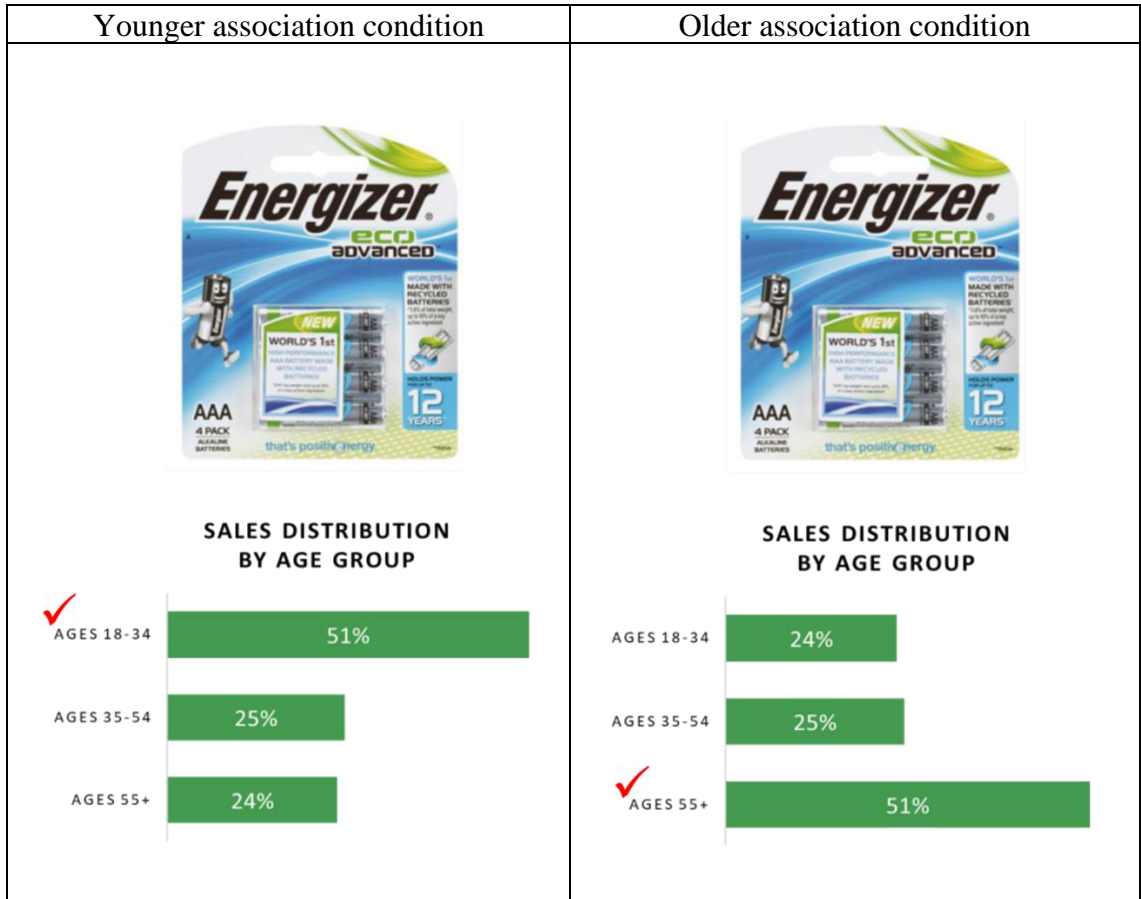
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## Appendix A. Study 1 Material

Regular options	Sustainable options
<p style="text-align: center;"><b>Regular batteries</b></p> 	<p style="text-align: center;"><b>Pro-environmental batteries</b></p> 
<p style="text-align: center;"><b>Regular light bulb</b></p> 	<p style="text-align: center;"><b>Energy saving light bulb</b></p> 
<p style="text-align: center;"><b>A4 Normal Notebook</b></p> 	<p style="text-align: center;"><b>A4 Recycled Notebook</b></p> 
<p style="text-align: center;"><b>Regular Garbage Bags</b></p> 	<p style="text-align: center;"><b>Eco-friendly Garbage Bags</b></p> 
<p style="text-align: center;"><b>Regular Pen</b></p> 	<p style="text-align: center;"><b>Pen Made from Recycled Bottles</b></p> 

## Appendix B. Study 3 Material



## **Chapter 8. General Discussion**

This thesis sought to investigate the influence of subjective age on consumer behavior. Two studies were undertaken to explore three key research questions: (1) How do shifts in subjective age affect consumer preferences for new technologies and sustainable products? (2) What underlying mechanisms drive this effect? and (3) What are the boundary conditions? This chapter will provide a summary of the research findings, discuss their theoretical and practical implications, and identify limitations while suggesting directions for future research.

### **8.1. Summary of Findings**

This thesis investigated the role of momentary shifts of subjective age (i.e., feeling younger or older than usual) on consumer behaviour, specifically new technology acceptance and sustainable consumption. Each of the two studies presented significant findings. This section will first discuss each essay's findings individually. Then, the findings from both studies will be discussed collectively.

Essay 1 investigated the impact of subjective age on new technology consumption. Expanding on previous studies on compensatory consumption, the research proposed that consumers would gravitate toward new technologies when they feel older than usual to regain a sense of youthfulness. The findings from three studies provided converging evidence that, when feeling older, consumers strategically choose new technologies as a symbolic means of self-completion. Study 1 demonstrated that a momentary increase in subjective age increased consumers' adoption of new technology (RQ1). Study 2 revealed that this effect was mediated by the perception that new technologies can provide a sense of youthfulness (RQ2). Further supporting the compensatory hypothesis, Study 3 indicated that the focal effect diminished when individuals had an opportunity to restore their sense of youthfulness before making the final choice (RQ3).

Essay 2 investigated how momentary shifts of subjective age influence sustainable consumption. It proposed that consumers would be more likely to gravitate towards sustainable products when they feel younger than when they feel older because such products align well

with their activated self-concept. It was also proposed that the perceived fit between consumers and sustainable products would mediate this effect. Three studies provided converging empirical evidence supporting these hypotheses. Study 1 demonstrated that feeling younger increased the preference for sustainable products over regular products (RQ1). Study 2 revealed that the perceived fit mediated this effect (RQ2). Further supporting the theoretical argument, Study 3 showed that the focal effect diminished when the association strength between sustainability and the younger generation was weaker (RQ3).

Taken together, this thesis found that situational shifts of subjective age can have a significant impact on consumer behaviour. Specifically, subjective age influenced consumer behaviour in two domains: the consumption of new technologies and sustainable products. The thesis further revealed that these effects occurred through two unique mechanisms. Essay 1 demonstrated that feeling older increased new technology consumption through the perception that new technologies would provide a sense of youthfulness. On the other hand, Essay 2 showed that feeling younger increased sustainable consumption because consumers perceived sustainable products as consistent with their identity, perceiving a greater fit with them. Taken together, the thesis found that momentary shifts of subjective, thus feeling older or younger, can shape consumer preferences and choices.

## **8.2. Theoretical Implication**

### **8.2.1. Implications on Subjective Age Literature**

The thesis makes several theoretical contributions to the subjective age literature. In doing so, it successfully addresses research gaps outlined in section 2.6. First, the present research expands the scope of the burgeoning literature on how situationally activated subjective age can influence human behaviour. Previous research has explored the effects of temporary shifts in subjective age within narrow domains (cf. research gap 2.6.1), including physical strength (Stephan et al., 2013), stereotypic attitudes (Eibach et al., 2010), preference for contemporary (vs. traditional) products (Amatulli et al., 2018), prosocial behaviour (Park et al., 2021), and preference for organic (vs. non-organic) food (Septianto & Kemper, 2021). The present research significantly broadens the scope of the existing literature by highlighting the

impact of momentary shifts in subjective age on two crucial consumer domains, namely, technology consumption and sustainable consumption.

Second, the thesis revealed two distinct mechanisms through which the temporary shifts of subjective age influence consumer behaviour. While there has been growing interest in the malleability of subjective age and its downstream effects, little research has investigated their underlying processes (cf. research gap 2.6.2). A notable exception is a study by Park et al. (2021), which demonstrated that feeling older enhances prosocial behaviour due to a heightened sense of responsibility towards the greater good, as consumers hold the lay belief that individuals should contribute more to society as they age. The present research fills this void in two ways. Essay 1 found that feeling older can lead to increased new technology consumption as a compensatory response to counteract the negative feelings associated with ageing. On the other hand, Essay 2 makes a valuable contribution by uncovering the underlying mechanism of perceived fit. This finding is significant because previous studies demonstrating the impact of feeling younger on engaging in younger behaviours, such as older consumers choosing more contemporary products when they feel younger (Amatulli et al., 2018), did not provide insight into how this effect occurs. Essay 2 fills this gap by highlighting the importance of perceived fit as the underlying process by which feeling younger influences consumer behaviour.

Third, the thesis contributes to the subjective age literature by demonstrating a contrast effect. In Essay 1, it was found that feeling older can lead to increased adoption of new technologies as a compensatory response to counteract the negative feelings associated with ageing. This finding stands apart from existing research on subjective age, both within and outside the realm of consumer research, which has generally shown that individuals tend to assimilate to the age they feel (i.e., assimilation effect; cf. research gap 2.6.3). In other words, feeling younger (older) is typically associated with developmental and consumer outcomes that are often linked to younger (older) individuals (e.g., Amatulli et al., 2018; Wettstein et al., 2021). By demonstrating that feeling older can prompt consumers to act contrary to the age they feel (i.e., contrast effect), the first essay uncovered a noteworthy exception to this pattern.

Fourth, while prior research has shown that feeling younger can impact older consumers (cf. research gap 2.6.4), both studies of the thesis demonstrate that this effect generalises to even

younger consumers. At first glance, one might expect older individuals to be more sensitive to temporal shifts in subjective age. However, the emphasis on youth in today's culture and the frequent reminders of age throughout daily life suggest that younger individuals would also be sensitive to subjective age change. Indeed, interest in anti-ageing starts even at a younger age. Thus, this thesis expands the understanding of the influence of subjective age on consumer behaviour by demonstrating that the relationship between subjective age and sustainable product preferences is relevant beyond specific age demographics.

### *Contrast or Assimilation?*

This section offers a more in-depth analysis of the divergent findings. As briefly discussed above, the two studies yielded somewhat contradictory results. In Essay 1, a contrast effect was wherein participants, when feeling older, opted for new technologies to recapture a sense of youthfulness. Conversely, Essay 2 identified an assimilation effect, where participants leaned toward choices consistent with their feelings. Existing research predominantly reports assimilation effects of subjective age, making the findings of Essay 1 a notable departure from the current literature.

How can we reconcile these divergent effects? First, we can view this conflict from the perspective of how subjective age was operationalised. To do this, it is essential to recall that the basis of the compensatory hypothesis was that feeling older creates unease and the desire to regain the sense of youthfulness. Thus, to identify the conditions for a contrast effect, we should ask when feeling older increases the desire to feel younger and when it does not.

One possible condition arises from the two studies' different manipulation techniques employed to manipulate subjective age. In Essay 1, where a contrast effect was observed, an imagination task was utilised to manipulate subjective age. Specifically, participants were asked to imagine attending a high school reunion where they discovered they appeared older than others. This scenario likely heightened participants' discomfort about ageing through social comparison, potentially motivating them to act in a manner contrary to their felt age (i.e., a contrast effect). On the other hand, the studies in Essay 2 employed different manipulation techniques. Participants were asked to contemplate being younger or older and compare it to

their current selves (Study 1) or were instructed to write about factors that made them feel younger or older (Studies 2 and 3). Compared to the imagination task in Essay 1, these manipulation techniques were less likely to evoke discomfort about ageing. They were thus more likely to result in behaviour consistent with the age they felt (i.e., an assimilation effect).

Another possibility is that an older subjective age might elicit more unease when it arises from situational manipulation than when measured. Prior research suggests that consumers are driven by both self-verification and self-enhancement motives (Swann, 2012). Self-verification strategies indicate that consumers frequently seek feedback that affirms their negative self-views. When consumers perceive self-discrepancy as chronic rather than temporary, their behaviours might align more with a self-verification motive than a self-enhancement motive (Mandel et al., 2015). Consumers with a higher subjective age, being accustomed to the feeling of ageing, might perceive an older age identity as the norm. As a result, they experience reduced unease and have diminished motivation to feel younger. Conversely, as highlighted in our research, a temporary spike in subjective age (i.e., feeling older than usual) can heighten consumers' sense of unease, driving a stronger urge to recapture youthfulness. This scenario heightens the likelihood of observing a contrast effect. Although this factor does not distinctly set apart the two studies—since both manipulated subjective age—it could provide insights into the contrast effect identified in the first essay.

Second, we can also examine the divergent findings from the vantage point of the dependent variable or the context in which we observed consumer behaviour. It is plausible that the impact of subjective age, whether measured or manipulated, simultaneously influences multiple mediating pathways. In such instances, what ultimately determines the pathway taken is often the context of the dependent variable. Therefore, we should consider which context is more likely to give rise to one route over the other. Certain products may be more conducive to producing a contrast effect, while others are better suited for observing an assimilation effect. Essay 1 utilised the stimuli including a robot-staffed hotel, a robot barista coffee shop, and an art exhibition featuring recent technologies. These options shared an important characteristic: they were consumed in a public context. As noted, the first essay used social comparison to induce an older subjective age, implying that the resulting age perception had a social origin.

Therefore, symbolic self-completion is more likely to occur through consuming products or services that bear social implications or can effectively signal to others that the consumer is youthful, as in the first essay. On the other hand, in Essay 2, stimuli consisted of everyday grocery items such as pens, light bulbs, garbage bags, batteries, and notebooks. These product categories are typically consumed privately, making them less likely to facilitate symbolic self-completion.

In summary, to reconcile the divergent findings from the two studies, we should consider the operationalisation of subjective age and the context in which its impact is measured. At this stage, the explanations are speculative and theoretical, and further research should strive to empirically provide evidence to offer a more comprehensive understanding of the impact of subjective age.

### **8.2.2. Implications on Other Literatures**

En route to examining the impact of subjective age on two crucial consumer domains and revealing its underlying mechanism, this thesis also contributes to the respective literature. First, the thesis expands upon existing research on the motivational aspects of new technology consumption. Previous studies have primarily focused on consumers' perceptions of new technology from utilitarian or functional perspectives (Davis et al., 1989; Ziamou & Ratneshwar, 2002) as well as hedonic or affective dimensions (Kulviwat et al., 2007; Melumad & Pham, 2020; Rauschnabel, 2018). However, recent research suggests that consumers also adopt advanced technologies to fulfil self-related needs, such as establishing a sense of importance or projecting an innovative persona (Rauschnabel, 2018; Wood & Hoeffler, 2013). By demonstrating that consumers strategically adopt new technology to reconcile self-discrepancies related to age identity, the thesis contributes to the literature on the motivational aspects of technology consumption. Moreover, through illustrating how momentary fluctuations in subjective age impact technology adoption, this study contributes to the growing body of literature elucidating the influence of contextual or situational factors on technology adoption (e.g., Kim et al., 2021; Shalev & Morwitz, 2012).

Second, this thesis contributes to the literature on compensatory consumption by introducing subjective age as a unique driving factor. Previous research has examined how critical demographic variables, such as gender identity, can stimulate compensatory consumption (Sobol & Darke, 2014; White & Argo, 2009; Willer et al., 2013). However, the thesis expands on this line of research by highlighting the subjective perception of age as another variable that triggers compensatory consumption, thereby enhancing the overall understanding of this phenomenon. This finding holds significant relevance because age plays a significant role in shaping one's identity (George, 1980), especially within today's youth-oriented consumer culture (Guiot, 2001; Twigg & Majima, 2014). Moreover, it is noteworthy that the current research demonstrated the situational influence of subjective age on identity. Consequently, our findings contribute to the existing literature, which highlights the significance of contextual or situational factors in shaping sustainable behaviors (Kim et al., 2020; Kim et al., 2022).

Third, the thesis adds to the literature on consumer identity and sustainable consumption by introducing subjective age as a unique driving factor. Previous research has focused on how a pro-environmental identity influences sustainable actions (Bartels & Hoogendam, 2011; Bartels & Onwezen, 2014; Juhl et al., 2017; Van der Werff et al., 2014). Relatedly, consumers' moral self-regard, heightened by the act of physical cleansing, led to an increased choice of pro-environmental option (Cui et al., 2020). Only a small body of research has demonstrated how self-concepts seemingly unrelated to sustainability, such as gender (Brough et al., 2016) or socioeconomic status (Kim et al., 2020), can still influence sustainable consumption. In line with this, the thesis found that age identity can substantially impact the preference for sustainable products.

### **8.3. Practical Implication**

This thesis also provides practical contributions. Essay 1 suggests that marketers can strategically shift consumers' subjective age to increase their consumption of new technologies. To fully leverage the power of subjective age, marketers can employ strategies to evoke a subtle sense of age among their customers. For instance, incorporating cues that remind individuals of

the passage of time or highlighting the generational gap between older and younger cohorts may elicit a sense of feeling older. One example can be found in Pfizer's marketing campaign, which promotes FOGO (fear of getting old) to bolster its marketing strategy. Their digital marketing message includes slogans such as "Conquer your fears of getting old at getold.com" and "Fear less. Live longer" (Elliott, 2014). By creating a similar marketing campaigns or product experiences that tap into these cues, marketers can align their offerings with consumers' desire to counteract the feeling of ageing, thereby enhancing the appeal of their technology products or services.

On the contrary, the findings of Essay 2 highlight a strategic opportunity to capitalise on the relationship between younger subjective age and the preference for sustainable products. Marketers can utilise these insights to tailor their marketing strategies effectively. By creating campaigns that evoke feelings of youthfulness, companies have the potential to enhance the appeal and consumption of green products. Retail environments can also be designed to evoke a youthful ambience. Companies can subtly guide consumers towards choosing green products over non-green alternatives by providing a shopping experience that resonates with younger perceived age. These findings offer policymakers a fresh perspective on promoting environmentally friendly behaviours. Public campaigns could be reframed to evoke a sense of youthfulness to encourage sustainable behaviours. Examples of such interventions are common. For instance, a well-known health and beauty product retailer in South Korea chose to brand itself as "Olive Young," a name cleverly suggesting vitality and youthfulness with its play on the words "All-Live-Young" (Korea Herald, 2013). Additionally, the Singaporean government named their action plan for successful ageing "I Feel Young SG" (Singapore Ministry of Health, 2023). Employing a comparable strategy to tap into the mindset associated with youthfulness, businesses and policymakers may have the opportunity to enhance the adoption of sustainable products and practices, thereby contributing to broader environmental objectives.

Taken together, the findings from the two studies suggest that marketers and policymakers can increase consumers' preference for the target product or service by shifting their subjective age. Notably, the two studies yield divergent findings, leading to different implications. While the findings of Essay 1 suggest that shifting consumers' subjective age to

make them feel older is beneficial for increasing the adoption of new technology, Essay 2 suggests that marketers should aim to make consumers feel younger to promote sustainable consumption. The choice of approach largely depends on the context and the specific product or service they aim to sell.

#### **8.4. Limitations and Future Research Directions**

This thesis has a few limitations that provide avenues for future research. First, as discussed earlier, one limitation of the thesis is that it did not provide empirical evidence to reconcile the divergent effects—a contrast effect in Essay 1 and an assimilation effect in Essay 2, observed in the two studies. Thus, future research should address this limitation by systematically investigating how different operationalisations of subjective age and the characteristics of the products or services under investigation determine whether we observe a contrast or assimilation effect.

In addition, future research may also explore whether an individual difference, such as self-esteem, distinguishes whether we observe a contrast or assimilation effect. According to Stuppy, Mead, and Van Osselaer (2020), dual motives of self-enhancement and self-verification guide consumers' behaviour, and the level of self-esteem significantly influences which motive directs their consumption decisions. In their studies, high self-esteem consumers chose superior products to boost their self-image, but low self-esteem consumers chose inferior products that affirmed their more pessimistic self-perception. Likewise, when feeling old, consumers with high self-esteem might choose a product that boosts their younger self-image, whereas those with lower self-esteem might choose a product that affirms their older self-perception.

Second, future research could explore more ecologically valid approaches to manipulate subjective age (cf. research gap 2.6.5). In the first essay, an old subjective age was induced by asking participants to write about things that make them feel older (Study 1) or to imagine a scenario that induces an older subjective age (Studies 2 and 3). The second essay induced younger subjective age by asking participants to think about being very old (vs. very young) and compare it to their current self (Study 1), as well as writing about things that make them feel younger (Studies 2 and 3). While these methods effectively shifted participants' subjective age

and proved useful in identifying their impact, they may not be readily applicable in real-world marketing settings. To achieve more tangible applications, subjective age manipulation should be conducted more subtly. For example, Amatulli et al. (2018) incorporated images of younger or older individuals in advertising, which could subtly shift the subjective age among older adults. Future studies could explore alternative methods that similarly and effectively evoke feelings of younger or older age more subtly, considering the practicality and feasibility in marketing contexts.

Third, future research can explore the impact of chronological age. Previous research on the malleability of subjective age has primarily focused on older adults, examining their susceptibility to feeling younger (Amatulli et al., 2018; Stephan et al., 2013) or older (Eibach et al., 2010; Hughes et al., 2013). This emphasis on older adults can be attributed to the fact that ageing is a more salient concern for this demographic than younger adults, allowing for greater potential for shifts in subjective age. Park et al.'s (2021) study showed an exception to this pattern, which demonstrated that the impact of feeling older applies to adults of all ages. In both studies of this thesis, subjective age manipulation influenced adults of all ages and did not find an apparent moderating effect of chronological age. Future research should systematically examine why particular effects are specific to older adults in some cases, while in others, they manifest across all adult age groups.

Fourth, future research may want to explore different mechanisms through which momentary shifts in subjective age can impact consumer behaviour. This thesis identified two mechanisms: compensatory consumption (Essay 1) and perceived fit (Essay 2). However, it is worth investigating whether there are other ways in which subjective age influences consumer behaviour. One possibility is that subjective age affects consumer behaviour through self-efficacy. Stephan et al. (2013) demonstrated that older adults who were told that they performed better than their same-aged peers following the first trial of a hand grip task (vs. those who did not receive such feedback) reported feeling younger and also performed better on the subsequent trial. Although not empirically tested, the authors suggested that increased self-efficacy may explain this effect. Such a new mechanism can present intriguing research possibilities in the consumer context. For example, older consumers often exhibit less

enthusiasm toward new technology because they perceive the learning curve to be challenging, making the costs of learning outweigh the benefits. However, feeling younger can foster a sense of efficacy in learning, and consequently, it may increase the adoption of new technologies. As such, exploring new mechanisms will further broaden the understanding of the literature.

## **8.5. Conclusion**

The familiar adage “You are only as old as you feel” encapsulates the widely recognised truth that subjective age holds greater significance than chronological age. Yet, what remains less understood is the dynamic nature of subjective age and its far-reaching impact on consumers. With this in mind, this thesis sought to investigate the malleability of subjective age and its downstream effects, centring on two consumer domains of significance today: new technology acceptance and sustainable consumption. Through two studies, the thesis found that temporary shifts in subjective age can significantly alter consumer behaviour in these domains through unique underlying mechanisms. The insights gleaned from the current work contribute to painting a more comprehensive picture within the realm of subjective age literature and lay the groundwork for unexplored avenues in future research.

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# Appendices

## Appendix A. Ethical Approval Letter



### Auckland University of Technology Ethics Committee (AUTEC)<sup>↵</sup>

Auckland University of Technology<sup>↵</sup>  
D-88, Private Bag 92006, Auckland 1142, NZ<sup>↵</sup>  
T: +64 9 921 9999 ext. 8316<sup>↵</sup>  
E: [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz)<sup>↵</sup>  
[www.aut.ac.nz/researchethics](http://www.aut.ac.nz/researchethics)<sup>↵</sup>

AUT

TE WĀNANGA ARONUI  
O TĀMAKI MAKĀU RAU

15 February 2022<sup>↵</sup>

Jungkeun Kim<sup>↵</sup>  
Faculty of Business Economics and Law<sup>↵</sup>

Dear Jungkeun<sup>↵</sup>

Re Ethics Application: **22/19 The impact of subjective age on consumer behaviour**<sup>↵</sup>

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).<sup>↵</sup>

Your ethics application has been approved for three years until 15 February 2025.<sup>↵</sup>

#### Standard Conditions of Approval<sup>↵</sup>

1. The research is to be undertaken in accordance with the [Auckland University of Technology Code of Conduct for Research](#) and as approved by AUTEC in this application.<sup>↵</sup>
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.<sup>↵</sup>
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.<sup>↵</sup>
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.<sup>↵</sup>
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.<sup>↵</sup>
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.<sup>↵</sup>
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard and that all the dates on the documents are updated.<sup>↵</sup>
8. AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.<sup>↵</sup>

Please quote the application number and title on all future correspondence related to this project.<sup>↵</sup>

For any [enquiries](#) please contact [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz). The forms mentioned above are available online through <http://www.aut.ac.nz/research/researchethics><sup>↵</sup>

<sup>↵</sup>

(This is a computer-generated letter for which no signature is required)<sup>↵</sup>

The AUTEC Secretariat<sup>↵</sup>  
Auckland University of Technology Ethics Committee<sup>↵</sup>

Cc: [chaein.lee@autuni.ac.nz](mailto:chaein.lee@autuni.ac.nz)<sup>↵</sup>