"The more you know, the less you fear.": A quantitative study on the effects of AI literacy, AI self-efficacy and perception of AI uncanniness on AI anxiety amongst adults.

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Master's Thesis
June, 2024

Abstract

With the rapid growth of Artificial Intelligence across various sectors, researchers have found an increase in fear and anxiety amongst the general population. Much of the research found today focuses on acceptance of technology models and analysis of effectiveness of these technologies. There is also a focus on whether anxiety surrounding technology leads to a decrease in acceptance. However, there is a critical lack of research into prevention of anxiety towards Artificial Intelligence. This thesis aims to tackle this research gap by analysing what variables can in fact lower AI anxiety amongst the general public. The dependent variables chosen for this thesis were AI literacy, AI self-efficacy, perception of AI uncanniness and innovativeness was chosen as a moderating factor. For this, an online survey was distributed that measured AI literacy, AI self-efficacy, AI uncanniness perceptions, innovativeness and AI anxiety. After collecting 154 valid results through distributing the survey on survey deploying sites such as Prolific and Surveyswap, the data was imputed into IBM SPSS software and was used to test various regressions and moderator relationships between the variables. In particular, it was found that participants with higher AI literacy are more likely to have lower AI anxiety. This relationship is also strengthened by the presence of high innovativeness amongst the participants. It is also found that participants with a negative perception of AI uncanniness are more likely to have higher AI anxiety. It is also important to note that lowering the negative perception towards AI uncanniness is important in lowering AI anxiety. These findings are useful in a range of various market sectors from education policy to marketing and AI developers.

Keywords: AI literacy, AI anxiety, AI self-efficacy, innovativeness, uncanniness.
Word count: 12944

Acknowledgements

First and foremost, I would like to express my deepest gratitude to my supervisor, Dr. Vivian Chen, whose expertise, understanding, and patience added considerably to my graduate experience. Though at first it was hard for me to gather my thoughts, your guidance and insightful feedback have been invaluable. This thesis would not have been possible without your constant support and encouragement.

A special thanks to my friends at Erasmus University Rotterdam and beyond. Your support, encouragement, and help with proofreading have been incredibly valuable.

Last but not least, I would like to say a big thank you to my family scattered all over the world. Thank you for telling me to keep going but equally, for telling me it is okay to take a break. Your belief in me has been my anchor and inspiration through the challenging times.

Table of Contents

1 Introduction

In recent years, Artificial Intelligence (hereby AI) has rapidly grown and become commercially available. Though AI includes many various definitions, for the purpose of this thesis, AI refers to unmanned systems and programs that learn from human interactions (Wang et al, 2022, p. 1; Babina et al, 2024, p. 4; Morikawa, 2017, p. 3). Investments in AI across various sectors have been steadily increasing (Babina et al, 2024, p. 2). Mergers related to AI grew 26-times from 2015 to 2017 (Furman & Seamans, 2019, p. 161). AI has been developing rapidly and expanding in various sectors. However, a large amount of development has been observed in the media and marketing sector. AI platforms are able to create content for a company's marketing purposes with a simple input of a few key words. ChatGPT is often used to create blog posts, which boosts search engine optimization (George & George, 2023, p. 21) as it collates information from databases to give it's output. Editing platforms such as Canva have adopted AI technologies for editing short form content as well as creating images based on a few key words (Olatunde-Aiyedun & Hamma, 2023, p. 6). With the ability to curate creative output, concerns arise over AI replacing human labour, with research indicating significant apprehension among workers (Furman & Seamans, 2019, p. 162). Nearly half of US jobs are at risk of computerization (Frey & Osbrone, 2017, p. 265), with 30% of workers fearing AI takeover (Morikawa, 2017, p. 10). Understanding the implications of AI is crucial as it shapes our future. Addressing these concerns can help industries mitigate AI anxiety and its impact on the workforce.

1.1 Artificial Intelligence

In certain sectors such as healthcare, AI developments have been a crucial component in streamlining the processes of image analysis and detection of diseases, among others (Du-Harpur, 2020, p. 425). These developments are often referred to as machine learning, where a system is able to learn from existing statistical patterns (Du-Harpur, 2020, p. 424). However, AI differs in that it's key component revolves around imitating human behaviours, rather than aid them (Du-Harpur, 2020, p. 424). Alan Turing had developed the "Turing Test" (also known as the Imitation Game) which was a test made to assess if an artificial intelligence can demonstrate human-like intelligence. The test consisted of a human and artificial intelligence getting questioned on various points and their answers would reveal if they were human or not (Hernandez-Orallo, 2000, p. 448) .

Since the development of the test, studies have been conducted to evaluate the effectiveness of it. It has been shown that with the rapid developments in the AI sector, the test becomes outdated as many of the AI is able to perform well in them (Gonçalves, 2022, p. 3). There are also a number of critiques concerning the "ambiguities, flaws and gaps in design" (Gonçalves, 2022, p. 4). Different sectors have different approaches to the implementation of AI. The developments of AI in other sectors such as finance and the arts have been less favoured by individuals due to the nature of the work that AI is taking on. Research has shown that individuals in more arts focused sectors such as marketing, tend to favour the use of AI in work that revolves around customer relationship management and key performance indicators rather than creative jobs such as campaign designs (Vlačić et al, 2021, 199). This is an important finding for this thesis because it is valuable to research why there is a discrepancy around this.

1.2 Research Question and Academic Relevance

Current AI research focuses on its impact on education quality (Farhi et al, 2023), hiring automation (Mirbabaie et al, 2021), and AI-assisted tools (Howard, 2019, p. 920). Stemming from automation in different work sectors, the development of AI for personal use has created anxiety towards AI (Kim et al, 2023, p. 5). Studies explore how AI anxiety influences technology adoption, but there's limited research on reduction of AI anxiety. Some suggest that improving ICT skills can alleviate techno-anxiety (Muñoz et al, 2016, p. 261). Therefore, this study will investigate the role of AI literacy in AI anxiety reduction. Further, adults' innovativeness has the potential to influence AI anxiety. Research indicates that individuals' innovativeness might correlate with reduced technology anxiety (Iddris et al, 2022, p. 11). Therefore, this thesis aims to investigate the influence of people's AI literacy on AI anxiety and how innovativeness can moderate this relationship. Given the information about different approaches to use of AI in various sectors, it is important to investigate what can predict AI anxiety amongst adults. In turn, this would be beneficial for future development and introduction of AI in academia and the workforce. In turn, understanding predictors of AI anxiety can extend the academic scope of research which is currently lacking investigation into ensuring that adults have a detailed and accurate understanding of what AI is and what it can add to their lives.

The Artificial Intelligence Anxiety (AIA) model will be utilised (Wang & Wang, 2022, p. 627) to examine how adults experience life with AI and their associated anxiety. The AIA model looks at factors that make up AI anxiety from the development and deployment of AI technologies. These factors include learning anxiety, job replacement anxiety, sociotechnical blindness (broader implications of the program) and AI configuration (interface) (Wang & Wang, 2022, p. 627). In previous research, anxiety towards AI was used as a predictor of AI readiness (self-efficacy) which showed that AI anxiety significantly lowers the readiness for AI amongst students (Dai et al, 2020, p. 4). Previous research about ICT literacy and increase of intention to adopt has found that there is a direct relationship between them (Mac Callum et al, 2014, p. 14)

However, the model overlooks factors that may reduce AI anxiety among adults (Wang et al., 2022, p. 1324). Research in various fields such as finance (Kadoya & Khan, 2017, p. 1545), health (Ying et al, 2022, p. 4) and education (Nizham et al, 2017, p. 136) have all suggested that the knowledge of a topic can ultimately reduce anxiety surrounding it. Thus, it is plausible to suggest that it is important to study AI literacy as a predictor of AI anxiety. Additionally, aspects of the original AIA model showcased that there is an aspect of AI anxiety pertaining to AI configuration. Research has suggested that the perceived uncanniness of AI may increase AI anxiety amongst individuals (Fortuna et al., 2022, p. 127). Therefore, this thesis will explore this together with other predictors in order to gauge if uncanniness is a suitable predictor for AI anxiety.

The Diffusion of Innovation theory suggests that innovativeness may play a moderating role in the relationship between knowledge and anxiety among adults (Bhadauria & Chennamaneni, 2022, p. 742). Research indicates that innovativeness increases behavioural intention towards new technology. Increased literacy in a subject also increases innovativeness and intention to adopt new technologies (Lund et al., 2020, p. 872). Therefore, this thesis will aim to explore if personal innovativeness of an individual will strengthen the negative relationship between AI literacy and AI anxiety.

The study's aim is to understand AI anxiety and if AI literacy and AI uncanniness is a suitable predictor of it. Therefore, the direct relationship between the factors must be explored. Looking at existing research, there is indication that personal innovativeness is a suitable moderator between the two factors. With deeper analysis into the topic of AI literacy, it has been observed that AI interface configuration may be a cause of AI anxiety. Given these findings, it is of interest to this study to test the relationship between these factors. Considering the existing gap in research surrounding the relationship between AI literacy, the perception of AI interface, AI anxiety and the moderating effects of personal innovativeness leads to the following research question:

"To what extent does artificial intelligence (AI) literacy, self-efficacy and the perception towards uncanniness of AI interface affect the anxiety towards AI and is moderated by innovativeness amongst adults?"

1.3 Societal Relevance

Understanding the impact of AI is important in contemporary society, as its influence intertwines with various facets of human life, ranging from employment to interpersonal connections. Given the large presence of AI technologies, it is crucial to explore how individuals' awareness and comprehension of AI correlate with their levels of anxiety, particularly among adults who are navigating the evolving digital landscape. This investigation serves as a pivotal step in addressing the prevailing anxiety surrounding the integration of AI into daily life. Particularly because research has suggested that AI increases productivity by 14% (Brynjolfsson et al, 2023, p. 1) and thus will likely be implemented amongst more companies to better their performance.

Delving into the relationship between adults' knowledge of AI and their anxiety levels provides valuable insights into societal perceptions and concerns regarding AI adoption and advancement. By discovering the connections between cognitive understanding and emotional responses to AI, researchers can clarify the underlying factors shaping individuals' attitudes towards this technology. Exploring the effects of AI interfaces and their perceived uncanniness will be important for further development of AI. This information will allow developers to reevaluate their design strategies of new AI developments which could lower the levels of AI anxiety and therefore, increase the use amongst the adult population.

The exploration of how innovativeness influences the relationship between knowledge of AI and anxiety levels offers a perspective on the complexities in technological acceptance and adaptation. Understanding how individuals' motivation for innovation interacts with their perceptions of AI can expand on the different attitudes towards technological progress and its implications for societal well-being. Such conclusions can inform the development of targeted educational initiatives aimed at enhancing AI literacy amongst the general public. By undertaking a comprehensive study of the relationship between AI knowledge, anxiety levels, and innovativeness among adults, researchers can play a crucial role in enhancing public understanding, guiding educational guidelines, and formulating strategies to facilitate the seamless integration of AI into society. This research is also particularly important for users and developers of AI in the workforce in order to understand how to properly leverage the technology to benefit them.

2 Literature Review and Theoretical Framework

This section of the thesis will focus on exploring the various concepts that will be utilised in conducting the research. It will also develop an understanding of existing literature surrounding the various concepts and what that research can indicate for the development of this thesis.

2.1 AI Anxiety

Anxiety in the context of technology means "overall negative attitudes toward computer-related technologies, their behaviours, and/or social impacts" (Wang & Wang, 2022, p. 620). Research into AI anxiety has suggested that it consists of three factors that largely contribute to people's worries about AI technologies. These factors are socio-technical blindness, confusion about autonomy and inaccurate understanding of technological development (Johnson & Verdicchio, 2023, p. 2267). Socio-technical blindness refers to the unawareness of humans that AI is indeed operating in conjunction with human beings and not against them (Johnson & Verdicchio, 2023, p. 2268). Confusion about autonomy stems from wording of autonomy where humans see it as taking action independently of others (Collier, 2002, p. 1). However, this is not an accurate definition for computer autonomy. In IT, autonomy refers to the automation of computer systems (Johnson & Verdicchio, 2023, p. 2269). Lastly, inaccurate understanding of technological development instils a fear amongst humans that AI will develop much more rapidly than expected and will in some capacity, be completely independent of human beings (Johnson & Verdicchio, 2023, p. 2269). These aspects were taken into consideration when developing the AIA model as they were crucial to understanding the complex reasoning behind AI anxiety (Wang & Wang, 2022, p. 622). The AIA model evaluates concepts associated with anxiety related to AI, including computer anxiety and robot anxiety (Wang & Wang, 2022, p. 621).

In the model, the four concepts for AI anxiety are learning anxiety which refers to fears about learning to operate AI; job replacement anxiety which refers to concerns regarding how AI may negatively affect the business environment; sociotechnical blindness which refers to the fear around boundaries between and dependency on AI and humans and AI configuration which refers to the uncanny interface of AI technologies (Kaya et al, 2024, p. 499). Research using the AIA model has been used previously to study AI anxiety as a variable to measure the effects of reactions to introduction of machine learning (Modliński et al, 2023, p. 7). The results of the study found that AI anxiety was a predictor of negative reactions towards machine learning introduced within the workplace (Modliński et al, 2023,

p. 13). Another study showed that there is a relationship between technological readiness contributors and inhibitors and AI anxiety. This study used the AI anxiety model and tested the individual subfactors individually rather than as one (Lemay et al, 2020, p. 29). The researchers suggested that their studies showed that increased conversation about inhibitors of technological readiness actually increases AI anxiety as individuals seem to have a fear towards real consequences of AI anxiety (Lemay et al, 2020, p. 30). Primarily, this was noticed around fears of job replacement. This shows that this model is flexible to be used in conjunction with other models in order to explore the causes and effects of AI anxiety. The model has proven that all four dimensions are valid to conceptualise and measure AI anxiety and therefore, all four dimensions will be tested as one.

2.2 AI Literacy

Literacy refers to the understanding of a set of symbols used for communication; letters, numbers, characters (Yi, 2021, p. 354). Stemming from literacy, AI literacy refers to the "set of competencies that enables individuals to critically evaluate AI technologies; communicate and collaborate effectively with AI; and use AI as a tool online, at home, and in the workplace" (Long & Magerko, 2020, p. 2). Though the process of measuring one's AI literacy has been a relatively new phenomenon, AI research has been developing for over half a century (Long & Magerko, 2020, p. 2). Prior to the development of AI, literacy over innovations was particularly important in the era of computerization. The term "digital literacy" was used to assess the competence one possesses when interacting with digital equipment (Ng et al, 2022, p. 505). This term has had and still holds a great level of importance due to the infiltration of digital equipment in the day to day lives of individuals. It is therefore crucial that most individuals have adequate digital literacy skills in today's time (Ng et al, 2022, p. 505). Digital literacy and AI literacy are highly intertwined. This suggests that AI literacy does not require for an individual to be an expert in AI but rather, have the ability to use AI skillfully and sensibly (Wang et al, 2022, p. 1324).

The development of AI for commercial and non professional use has been deployed in recent years, therefore, there has been a greater interest in exploring AI literacy as well as developing better AI literacy skills. The infiltration of AI in the daily lives of individuals makes AI literacy a crucial skill to have in order to accurately use and distinguish AI platforms. Research has shown that there are many efforts amongst legislators to implement AI literacy classes in school systems as a way to prepare new generations to interact with AI with utmost understanding (Long & Magerko, 2020, p. 1). Research has suggested that increased AI competence amongst humans can create better human-AI interactions. This therefore results in better productivity (Brynjolfsson et al, 2023, p. 1) and reduced costs to companies (Jarrahi, 2018, p. 583). The research also proposes that there be a better balance and understanding between humans and AI in order for humans to not feel inferior in comparison to AI.

To achieve this balance, it is vital that humans have a well-rounded and informed understanding of what AI technology can do and how it operates (Jarrahi, 2018, p. 584). When developing models to assess AI literacy, researchers seem to have slightly varying versions of concepts that encompass AI literacy. These concepts include awareness, usage, evaluation, and ethics (Wang et al, 2022, p. 1326). Other researchers suggest that another important concept to address in AI literacy is self-efficacy (Carolus et al, 2023, p. 6).

2.3 AI Self-Efficacy

Unlike literacy, self-efficacy relates to the confidence one has of themselves to complete a certain task. In the context of this thesis, this task is to interact with AI. Studies into self-efficacy in the digital realm have been present throughout history. However, with the increase of autonomy of technology, such as AI, it has been increasingly important to measure an individual's self-efficacy in regards to their personal belief in themselves to take on a new form of technology (Ulfert-Blank & Schmidt, 2022, p. 2). Self-efficacy can be seen as an extension of literacy whereby an individual that is digitally literate can take the knowledge and apply it to different scenarios in order to problem solve (Ulfert-Blank & Schmidt, 2022, p. 2). Research has suggested that individuals with low self-efficacy find new technologies and systems much more intimidating (Hong, 2022, p. 175). On the contrary, people with high self-efficacy are confident in their skills when using new technology which suggests that self-efficacy could decrease levels of anxiety surrounding AI and other systems (Hong, 2022, p. 176). Some literature suggests that a variable that is important to test when discussing AI literacy is AI self-efficacy. This is due to the fact that AI literacy suggests that

an individual has a sense of control over their interaction with AI. This control is often referred to as self-efficacy (Dai et al, 2020, p. 3). Therefore it is suggested that AI literacy is not only related to the knowledge of what AI is or how to use but also the sense of control that one has over their use of AI. Other research has also shown that self-efficacy is a predictor of interaction with AI. This study showed that high self-efficacy is desirable when adopting new technologies and interacting with these technologies (Wienrich et al, 2022, p. 16). AI literacy was also shown to correlate with high levels of self-efficacy (Hsu et al, 2022, p. 560). This is due to the fact that high self-efficacy displays one's confidence in their abilities to complete a task or to learn how to complete a task (Hsu et al, 2022, p. 561). Therefore, it is suggested that when measuring AI literacy, AI self-efficacy can also be a viable concept to test in order to understand not only if an individual knows how to work AI but also if they have the self efficacy to actually put the theory into practice.

2.4 AI Literacy, AI Self-Efficacy and Anxiety Towards AI

A study has shown that enhancing problem-solving abilities can reduce anxiety regarding IT-related technologies (Muñoz et al., 2016, p. 262). This implies that even without in-depth knowledge, simply being aware of and able to differentiate these technologies can help alleviate anxiety surrounding them (Muñoz et al., 2016, p. 262). Research into AI literacy and AI anxiety has been conducted where AI literacy had a direct effect in lowering AI anxiety (Schiavo et al, 2024, p. 3). The overall study focused on how AI anxiety can mediate the effect between AI literacy and AI acceptance and shows that AI anxiety lowers AI acceptance (Schiavo et al, 2024, p. 3). The direct relationship between AI literacy and AI anxiety was proven to be significant (Schiavo et al, 2024, p. 7).

Looking at specific predictors of AI anxiety, Kaya et al (2024, p. 509) found that AI anxiety was a useful predictor of negative behaviour towards it and therefore the paper suggested that "AI learning may be an important factor in fostering more positive views of AI". Therefore, it is appropriate to suggest that it is important to have ICT skills to be less anxious about new technologies and their implementation. The following hypotheses are proposed:

H1: AI literacy is negatively associated with AI anxiety.

H2: AI self-efficacy is negatively associated with AI anxiety.

2.5 Personal Innovativeness

Developed by Everett M. Rogers in 1962 (Rogers, 2003, p. 10), Diffusion of Innovation looks at how technologies are introduced into society. There are four stages to this diffusion process which includes the creation of the innovation itself, communication channels through which this technology is being diffused, the time it takes to do so and the social systems that are involved in introducing the innovation into society. Rogers has developed different adopters based on their social systems. They are the innovators, early adopters, early majority, late majority and laggards (those sceptical about change) (Rogers, 2003, p. 247). Based on the Diffusion of Innovation theory, innovativeness of an individual has become a crucial aspect of determining their acceptance to change. Innovative people have shown to have a greater interest in obtaining information about new ideas. They are also presented as being much more positive about new developments (Lu et al, 2005, p. 251). A limitation of the Roger theory is that it implies that innovativeness is measured only after the innovation has already been introduced to the masses rather than measuring general innovativeness towards any technology. However, another definition of innovativeness refers to the personality aspects that relate to reaction to change (Kirton, 1980, 215) which suggests that personality predispositions to any change can be measured. In the context of this thesis, innovativeness will be referred to as ‘personal innovativeness’ which according to studies is a more accurate term as innovativeness is very individual and does not correlate with others (Agarwal & Prasad, 1998, p. 205). Prior research has shown that there is a link between innovativeness and early adoption. Findings also suggested that those students that have a more entrepreneurial mindset are more open to using AI in their future work postgrad. Thus, suggesting that there is a link between entrepreneurial students being deemed as early adopters of an innovation (Iddris et al, 2022, p. 12).

Innovativeness in literature surrounding AI is often related to adoption of AI rather than AI anxiety (or lack thereof). Rogers (Rogers, 2003, p. 248) has also outlined that innovators are typically equipped with a set of predispositions that result in them being innovators. A key predisposition is that innovators have the ability to both understand and apply difficult knowledge pertaining to a certain technology. Therefore, it is important to test the relationship between knowledge and application of AI literacy and self-efficacy and if there is a positive relationship between these variables and innovativeness as suggested by Roger (Rogers, 2003, p. 248). Given the prior research, it is plausible to suggest the following hypotheses:

H3: AI literacy is positively associated with personal innovativeness.

H4: AI self-efficacy is positively associated with personal innovativeness.

2.6 Personal Innovativeness and Anxiety Towards AI

Studies surrounding technology adoption have often used innovativeness as a moderating factor between different variables. Innovativeness has often moderated effects between reasoning and action, suggesting that individuals with higher personal innovativeness are likely to adopt a technology without needing much reasoning behind it (Jeong et al, 2009, p. 161). Other studies also supported that innovativeness is an important moderator pertaining to adoption of technological advancements (Chen, 2022, p.4). Studies have shown that innovators are more likely to adopt AI technologies and have more prior knowledge about AI whilst laggards are shown to not be open to AI technologies (Park & Woo, 2022, p. 85). This study has also shown that personal innovativeness is related to a positive attitude towards AI (Park & Woo, 2022, p. 80). Although this thesis is not focusing on adoption of technological advancements, an interesting study amongst adults showed that although tech anxiety was observed, intention to adopt was still high due to the understanding of the benefits of technology (Sugandini et al, 2022, p. 208). This finding is interesting for this thesis because it focuses on adults' support of technology benefits and their literacy of it and these factors aren't changed based on anxiety they may have. Based on previous findings, it is plausible to suggest that higher personal innovativeness may decrease AI anxiety as it has been shown to increase acceptance of technology and positive attitude towards AI. Individuals with high personal innovativeness towards IT also showcase knowledge about IT.

Previous studies have also used personal innovativeness as a moderator between exposure to new technologies, the perceptions towards it and to their acceptance (Agarwal & Prasad, 1998, p. 213). It was shown that personal innovativeness provided a moderating effect between IT compatibility and intention to adopt. As suggested by the researchers, the level of innovativeness in an individual, results in the risk-taking that they possess when working with new technologies. Therefore, personal innovativeness has been chosen as a moderator between AI literacy and AI anxiety, as it can weaken the negative relationship between AI literacy and AI anxiety. Although it can be argued that adoption of AI and lack of AI anxiety are not related terms, research has shown that low AI anxiety in turn suggests that there are higher adoption levels of AI (Wang et al, 2022, p. 8). Personal innovativeness is often measured by the readiness of an individual towards a new technology, thus suggesting that readiness directly negatively affects AI anxiety (Ismail et al, 2011, p. 12774). It is plausible to suggest that it will weaken the relationship because from prior research it is evident that personal innovativeness can lower anxiety towards technology and therefore prompted the following hypotheses:

H5: Personal innovativeness is negatively associated with AI anxiety

H6: Personal innovativeness will strengthen the negative relationship between AI literacy and AI anxiety.

Regarding self-efficacy, this is particularly interesting to this study as research into digital self-efficacy leans into exploring individuals' personality aspects which correlates with the variable of personal innovativeness (Ulfert-Blank & Schmidt, 2022, p. 9). Given that the previously mentioned research includes self-efficacy as a potential descriptor of AI literacy, it is plausible to suggest the following hypothesis:

H7: Personal innovativeness will strengthen the negative relationship between AI self-efficacy and AI anxiety.

2.7 Perceived Uncanniness

The concept of uncanniness comes from the term “uncanny valley” coined by Masahiro Mori in 1978. This term explores the trajectory of a robot getting human-like features until at one point the design reaches too much of a resemblance to human beings before becoming less human-like again. This high resemblance is called the uncanny valley where research has shown, human appeal towards the human-like robot becomes negative (Mori, 2012, para. 2). Research has shown that individuals who interact with human-like artificial intelligence experience a higher level of uncanniness towards the AI (Ciechanowski et al, 2019, p. 539) . In the research, ‘human-like’ referred to an avatar that was displayed on a screen rather than a set of words that is commonly seen in AI chatbots (Ciechanowski et al, 2019, p. 541). It is seen amongst certain companies that they aim to create a ‘human-like’ experience of interaction by giving the chatbot a name, such as Google’s *Gemini* (previously known as *Bard*) (Aydin, 2023, p. 2). However, research has shown that by doing so, individuals experience a higher level of uncanniness towards the technology (Brédart, 2021, p. 35).

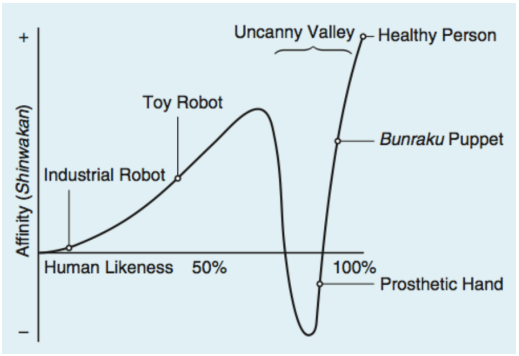

Figure 1. Uncanny Valley (Mori, 2012, para. 6)

The concept of anthropomorphism (Duffy, 2003, p. 180) explores the application of human-like attributes to inanimate objects and closely relates to the uncanny valley. In the context of this thesis, anthropomorphism is applied to AI technology. Other researchers suggest that AI’s ‘human like’ design may increase the individual’s intention to adopt the technology (Blut et al, 2021, p. 648). This was examined by merging ICT literacy and ICT anxiety, along with other variables, to form a 'user predispositions' factor. Both ICT literacy and anxiety were found to be influential predictors of a favourable AI anthropomorphism outlook and a positive inclination towards adopting AI (Fortuna et al, 2022, p. 133).

2.8 Perceived Uncanniness and Anxiety Towards AI

Research has suggested that AI anxiety also arises from the display of the AI where users feel that AI interfaces in chat-bots are quite uncanny which in turn creates anxiety about how this may develop in the future (Ciechanowski et al, 2019, p. 546). This research suggests that the main factor of the rise of AI anxiety in relation to anthropomorphized technology is the uncanniness in consciousness thinking that AI technology may develop (Li and Huang, 2020, p. 2). On the other hand, some research has suggested the opposite and that actually the human-like attributes of AI may decrease anxiety towards it (Epley et al, 2007, p. 874). However, in the research they referred to anxiety as a social and mental issue that did not pertain directly to AI anxiety. This thesis has established that AI anxiety refers directly to interaction with AI and the future of the technology. Thus, it is not accurate to assume that lowering anxiety refers to lowering AI anxiety. Studies have shown that uncanniness of AI is not always a physical attribute of the AI but rather the lack of ambiguity that AI has (Sullivan, 2020, p. 529). It suggests that AI anxiety arises from the fact that although AI has human-like reasoning, it lacks human-like emotions which therefore makes it uncanny as it is human-like but not human enough (Sullivan, 2020, p. 530). There has also been a relationship found between AI anxiety and AI configuration which suggests that the way AI is presented (configured) is a big factor as to whether or not an individual feels that it may be threatening and thus, causing AI anxiety (Lemay, 2020, p. 30).

Previous research has shown that there is a relationship between negative perception towards AI uncanniness and anxiety towards it (Mohanna & Basiouni, 2024, p. 1320). It was shown that negative perception arises when it is unclear if the program that the individual is interacting with is AI or not due to it's likeness. This leads to the assumption that negative perception of AI uncanniness may lead to an increase in AI anxiety.Therefore, this thesis is interested in testing if the perception of uncanniness of AI technologies may lead to AI anxiety. Thus, proposing the following hypotheses:

H8: Negative attitude towards AI uncanniness is positively associated with AI anxiety.

If H8 is true, H9: Positive attitude towards AI uncanniness is negatively associated with AI anxiety.

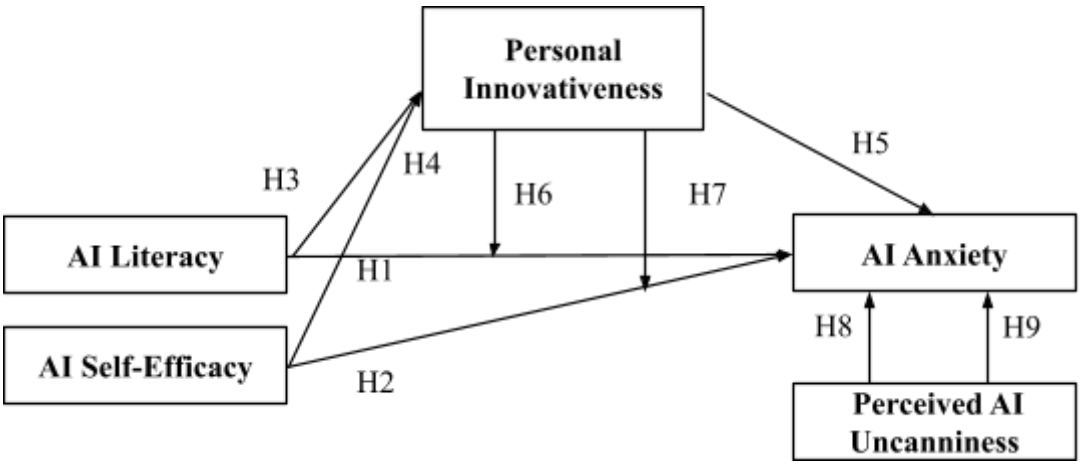

Figure 2. Research Model

3 Methods

This section of the thesis will be focusing on discussing the research approach to answer the research question. It will cover the introduction and justification of utilising a quantitative research method. Followed by a detailed outline of the sampling, data collection and analysis. This section will also introduce the measures that will be employed to conduct the research.

3.1 Research Design

To answer the research question and subsequent questions, a quantitative online survey was created using Qualtrics to measure adult's levels of AI anxiety and if their level of AI literacy and perceived AI uncanniness are suitable predictors for this. As well as testing the moderating effect of personal innovativeness. The online quantitative approach to this thesis is most applicable as it allows a larger scope of research to be conducted by testing multiple variables and hypotheses. By conducting quantitative research it allows for an international reach of participants (Evans & Mathur, 2018, p. 856). By having access to this reach, researchers are able to get well-rounded data from individuals of different backgrounds. This in turn results in conclusions which are applicable to a bigger majority of the world's population. It is extremely valuable for the researcher to utilise the accessibility of online surveys as this thesis has time constraints for data collection. With an online survey, it gives the researcher access to participants in a timely manner (Evans & Mathur, 2018, p. 856). A critical strength of online surveys is the quality of completion. By using online platforms for surveys, it allows the researcher to make questions compulsory to answer which in turn, creates fully completed, quality responses (Evans & Mathur, 2018, p. 858). Therefore, with a topic that may have many predictors, it is valuable to conduct a quantitative survey.

It was also recognized by engaging with past research that a quantitative research approach is adopted in this field of work in regards to measuring the effects of a variable on another. The work in this field targets many variables and tests relationships with these variables. Therefore, to get a broader understanding of effects of the IV to the DV, it is useful to deploy a questionnaire-style survey. It was adopted for this thesis as it is thought to be the best method used when attracting a large sample of respondents. It is a method that is beneficial not only for collecting demographic data but is also used to gather opinions by using different factors and measures (Matthews & Ross, 2010). Another advantage of using

an online survey is that the researcher is not present in any way during the survey completion, which eliminates any pressure off the participants (Vehovar & Manfreda, 2017, p. 143).

3.2 Sampling

3.2.1 Target Population

The target sample was adults from different academic and professional backgrounds. Adults were chosen to be targeted as it allows for a greater breadth of research as it allows anyone over the age of 18 to participate in the research. There were no geographic boundaries on where the participants were from or are living now. By setting minimal conditions for response, it allows people from different backgrounds to give their insights on the topic of AI. As it is a prevalent topic in most market sectors, it is appropriate to get a diverse sample in order to get a more accurate answer to the research question. It was observed that there is a lack of research that targets AI anxiety predictors overall. By setting one requirement, it makes the survey accessible to participants of varying age and background.

3.2.2 Sampling Procedure

It is recognised that distributing surveys on more personal social network sites such as Facebook and Instagram, may lead to bias as it is a network site that is aimed at connecting individuals you may already know (Kim & Cha, 2017, para. 33). Therefore, this survey was shared on Prolific, a survey deploying website which allows participants from different regions, ages and backgrounds to access your survey. It was also shared on SurveyCircle which allows other researchers to participate in completing surveys. For this thesis, the researcher did not put any restrictions on regions, ages or any other demographics. The only requirements were that the participant could understand English and was over the age of 18.

Due to the design of the platforms it allows individuals that are not connected with you at all, to encounter your survey. These people are not those whom the researcher knows personally and therefore, is a useful tool to gain a bigger sample of participants for the research. However, all individuals that are on survey deploying sites are readily available to participate in surveys. Therefore, the sampling strategy for this survey was a non-probability convenience sampling method (Fricker, 2017, p. 166). Unlike snowball sampling (Emerson, 2015, p. 166), non-probability sampling creates a less biassed sample of respondents. It is especially encouraged when there is minimal criteria for participation in the study. Therefore, recruiting participants is much more accessible with non-probability convenience sampling.

This study is categorised as the non-probability convenience sampling method because the survey was distributed on survey sharing platforms, Prolific and SurveyCircle, and therefore the researcher had no knowledge of a probability system (Fricker, 2017, p. 166). This method is best as it avoids any potential biases towards the researcher and vice versa. It also allows for a bigger scope of participants to be reached than just utilising the existing network of the researcher.

3.2.3 Research Procedure

The survey started with an explanation of the purpose of the study. This outlined the brief topic of the research however making sure that there was not too much information prior to the survey about what would be tested in the survey. This would eliminate any exposure to the full topic and therefore judgements about answers prior to completing the survey. It was also mentioned that participation is voluntary and that there are no risks associated with the research. The researcher also provided contact details about the study, should any of the participants have a reason to contact them (See AppendixA for full consent form). After consenting to participate, the next question asked the participants to state if they were over the age of 18 which they had to agree or disagree to. This was done as a criteria check as well as to eliminate any minors from completing the survey.

The first section of the survey focused on AI literacy followed by AI self-efficacy, personal innovativeness, AI anxiety and lastly perception of AI uncanniness. The survey finished off by asking demographics questions. The total number of items including demographics was 58. All questions in the survey had a requirement to be answered. This eliminated the possibility of incomplete responses. The survey was distributed for four days (10-13th of May 2024) after which the data was input into IBM's SPSS program to test the results. There was no cleaning necessary for the data as all 154 responses were fully completed and matched the criteria of the participant being over 18.

3.2.4 Sampling Results

The total number of participants in this survey was 154. Of those, 54 (35.06%) were males and 100 (64.94%) were females. The age range was 18 to 74.(M_{age} = 31.49, *SD* = 11.46). Participants came from 28 different nationalities. Every participant obtained at least a high school diploma with 29.2% only receiving a high school diploma. Bachelor's degrees were the largest category of education (47.4%). Followed by Masters (16.4%), Associate (3.2%), Phd (1.3%), Vocational (1.3%), Professional (0.6%) and undisclosed 'others' (0.6%). All participants are over the age of 18. All participants completed all questions.

3.3 Validity and Reliability

To ensure the validity of the research, pre-existing and tested scales are used. These scales have been adopted by other research papers which were also discussed earlier in the paper within the theory section. The complexity of these measures, although present, often are presented together in different research fields as a way to describe relationships. By using pre-existing and tested scales, it ensures that the data will be valid and therefore appropriate to use in this research. The multidimensionality of the research is justified by previous research in the field which further adds to it's validity. It is important to note that the chosen scales have shown a Cronbach alpha value of 0.7 or above in papers where these scales were developed. To ensure the reliability of the research, all steps taken to complete the research are outlined in the methods section of this thesis. It allows this research method to be replicated by others and achieve similar outcomes. By using a non-probability convenience sampling method through online survey deploying sites, it reduces the chances of biases towards the researcher whilst increasing the chances of higher completion rates. The dimensions within the scales that are used for this paper have been pre-tested by the researchers that developed these scales, therefore this ensures their reliability. Multidimensional scales have not been developed for this research and all multidimensional scales have been adapted from previous research. The wording of the scales was slightly adopted to associate better the topic of AI for this thesis.

3.4 Measures

The survey contains questions pertaining to AI literacy and AI self-efficacy, personal innovativeness, AI anxiety and AI uncanniness. All variables were tested using pre-existing, validated scales. This increases the validity of the data collection. All scales were presented on a 7 point likert scale (1 = strongly disagree to 7 = strongly agree). One of the scales was originally presented with a 5 point likert scale, however, research shows that there is practically no difference in validity when using a 5 or 7 likert scale (Altuna & Arslan, 2016, p.16; Dawes, 2008, p. 8). However it creates consistency within the survey and makes it easier for the participants to answer the questions as they are exposed to the same options for answering. The order of these questions were developed based on the length of the chosen scales. By alternating between longer and shorter scales, it ensures that individuals do not lose motivation by answering too many questions back to back. (See Appendix A for a full list of questions).

AI Literacy

To measure AI literacy, the Artificial Intelligence Literacy Scale (AILS) was adopted (Wang et al, 2022, p. 1324). The scale consisted of 12 items. Though there are four additional subfactors in the scale pertaining to AI awareness, use, evaluation and ethics, the researches (Wang et al, 2022, p. 1334) suggest that the AILS be used to measure overall AI literacy rather than various subfactors as this improves reliability of the scale. The Cronbach's alpha of the AILS is 0.83 (Wang et al, 2022, p. 1332) which makes it a reliable and suitable scale to use in this thesis. All 12 items of the AILS were used. The items were rated on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree).

The reliability analysis of this thesis revealed that Cronbach's alpha was .49. This is therefore not considered to be a reliable scale (Pallant, 2020, p. 102). AI literacy validity was increased through looking at the Item-Total Statistics (Appendix B1) of the reliability analysis in order to gauge what factors are significantly decreasing the validity of the scale. It was found that the items that focused on negative AI literacy were those that lowered the validity of the scale significantly. In order to see if these items would create one factor, a factor analysis was performed (Appendix B2). However, these items did not load onto one factor and could not be formed into one, negative AIL variable. Therefore, it was decided that those items be omitted which increased the validity of AIL to .80. The mean score was 5.09 (SD = 0.82), suggesting that participants had a moderately high level of AI literacy.

The 9 items which were Likert-scale based were entered into an exploratory factor analysis using Principal Components extraction with Direct Oblimin rotation based on Eigenvalues (> 1.00), KMO = .80, $\chi 2$ (N = 154, 36) = 475.20, $p < .001$. The resultant model explained 67.6% of the variance in AI literacy measures. Factor loadings of individual items onto one factor found are presented in Table 1. The three factors found were:

Knowledge of Use. This factor includes five items that describe the ability of choosing appropriate types of AI and applying this knowledge to use AI skillfully.

AI Ethics. This factor includes two items that describe actions pertaining to AI ethics and technological abuse of data.

AI Identification. This factor includes two items that pertain to distinguishing between AI and non-AI applications.

Table 3.4.1. Factor loadings, explained variance and reliability of the three factors found for the scale 'AI Literacy'.

Item	Knowledge of Use	AI Ethics	AI Identification
I can use AI applications or products to improve my work efficiency.	.88		
I can choose the most appropriate AI application or product from a variety for a particular task.	.83		
I can choose a proper solution from various solutions provided by an AI.	.80		
I can skilfully use AI applications or products to help me with my daily work.	.75		
I can evaluate the capabilities and limitations	.62		

of an AI application or product after using it for a while.			
I always comply with ethical principles when using AI applications or products.		.83	
I am always alert to the abuse of AI technology.		.76	
I can distinguish between AI and non-AI applications.			.91
I can identify the AI technology employed in the applications and products I use.			.84
R^2	.42	.13	.12
Cronbach's α	.84	.48	.74

AI Self-Efficacy

To measure AI self-efficacy, the AI self-efficacy scale (AISES) was adopted (Holden & Rada, 2011 as cited in Shao et al, 2024, p. 6). This is a 10 item scale. The Cronbach's alpha of the AISES is 0.97 (Shao et al, 2019, p. 6) which makes it a reliable and suitable scale to use in this thesis. It is presented by asking participants "In general, I could complete any desired task using the AI technology if…" before presenting 10 scenarios. All 10 items were used in this thesis. The participants have answered to the extent to which they agree on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). The reliability analysis of this thesis revealed that Cronbach's alpha was .80. This is therefore considered to be a reliable scale (Pallant, 2020, p. 102). The mean score was 4.99 (*SD* = 0.93), suggesting that participants had a moderately high level of AI self-efficacy.

The 10 items which were Likert-scale based were entered into an exploratory factor analysis using Principal Components extraction with Direct Oblimin rotation based on Eigenvalues (> 1.00), KMO = .84, $\chi 2$ (N = 154, 45) = 562.86, $p < .001$. The resultant model explained 58.7% of the variance in AI self-efficacy measures. Factor loadings of individual items onto one factor found are presented in Table 2. The two factors found were:

Assisted Self-Efficacy. This factor includes eight items that describe the ability of using AI technology if minimal assistance was available.

Unassisted Self-Efficacy . This factor includes two items that describe the ability of using AI technology if no assistance was available.

Table 3.4.2. Factor loadings, explained variance and reliability of the two factors found for the scale 'AI Self Efficacy'.

Item	Assisted Self-Efficacy	Unassisted Self-Efficacy
In general, I could complete any desired task using the AI technology if I had used similar technologies before this one to do the same task.	.83	
In general, I could complete any desired task using the AI technology if someone showed me how to do it first.	.81	(-.35)
In general, I could complete any desired task using the AI technology if someone else helped me get started.	.75	
In general, I could complete any desired task using the AI technology if I could call someone for help if I get stuck.	.72	
In general, I could complete any desired task using the AI technology if I had just the built-in help facility for assistance.	.69	

In general, I could complete any desired task using the AI technology if I had seen someone else using it before trying it myself.	.63	
In general, I could complete any desired task using the AI technology if I had a lot of time to complete the task for which the technology was provided.	.57	(.30)
In general, I could complete any desired task using the AI technology if I had only the manuals for reference.	.56	(.51)
In general, I could complete any desired task using the AI technology if I had never used technology like it before.		.80
In general, I could complete any desired task using the AI technology if here was no one around to tell me what to do as I go		.74
R^2	.40	.19
Cronbach's α	.85	.61

Personal Innovativeness

To measure personal innovativeness, the Personal Innovativeness in IT (PIIT) scale was used (Agarwal & Prasad, 1998, p. 210). This is a 4-item scale that measures personal innovativeness in the context of information technology. This scale was developed using the Diffusion of Innovation theory which was mentioned earlier as a theoretical model that will explain personal innovativeness as a moderator. The Cronbach's alpha of the PIIT scale is 0.84 (Agarwal & Prasad, 1998, p. 210) which makes it a reliable and suitable scale to use in this thesis. All four items were used in this thesis. These items were rated on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree) (Agarwal & Prasad, 1998, p. 210).

The reliability analysis of this thesis revealed that Cronbach's alpha was .22. This is therefore not considered to be a reliable scale (Pallant, 2020, p. 102). Personal innovativeness was increased through looking at the Item-Total Statistics (Appendix B3) of the reliability analysis in order to gauge what factors are significantly decreasing the validity of the scale. It was found that one item that focused on negative personal innovativeness was the one that lowered the validity of the scale significantly. In order to see if this item would create one factor, a factor analysis was performed (Appendix B4).

However, the item did not load onto one factor and could not be formed into one, negative personal innovativeness variable. Therefore, it was decided that this item be omitted which increased the validity of PIIT to .72. The mean score was 4.79 (*SD* = 1.41), suggesting that participants had a moderate level of personal innovativeness.

The 3 items which were Likert-scale based were entered into an exploratory factor analysis using Principal Components extraction with Direct Oblimin rotation based on Eigenvalues (> 1.00), KMO = .72, $\chi 2$ (N = 154, 3) = 243, p < .001. The resultant model explained 79.9% of the variance in personal innovativeness measures. Factor loadings of individual items onto one factor found are presented in Table 4. The one factor found was:

Personal innovativeness in IT. This factor includes 3 items that pertain to an individual's personal innovativeness towards new AI technology.

Table 3.4.3. Factor loadings, explained variance and reliability of the one factor found for the scale ‘Personal Innovativeness’.

Item	Personal Innovativeness
I like to experiment with new AI technologies.	.92
If I heard about a new AI technology, I would look for ways to experiment with it.	.90
Among my peers, I am usually the first to try out new AI technologies.	.86
R^2	.80
Cronbach’s α	.87

AI Anxiety

To measure AI anxiety, the AIA scale (AIAS) was adopted. This scale consists of 21 items. There are 4 sub factors that make up the AI anxiety scale - learning anxiety, job replacement anxiety, sociotechnical blindness (broader implications of the program) and AI configuration (interface) (Wang & Wang, 2019, p. 627). Originally the scale had 57 items, but the researchers have done a reliability test that suggests that only 21 items were significant. The Cronbach's alpha of the AIAS is 0.96 (Wang & Wang, 2019, p. 624) which makes it a reliable and suitable scale to use in this thesis. All 21 items were used in this thesis. These items were rated on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). The reliability analysis of this thesis revealed that Cronbach's alpha was .92. This is therefore considered to be a reliable scale (Pallant, 2020, p. 102). The mean score was 4.06 (*SD* = 1.09), suggesting that participants had a moderate level of AI anxiety.

The 21 items which were Likert-scale based were entered into an exploratory factor analysis using Principal Components extraction with Direct Oblimin rotation based on Eigenvalues (> 1.00), KMO = .90, $\chi 2$ (N = 154, 210) = 2944.79, $p < .001$. The resultant model explained 69.7% of the variance in AI anxiety measures. Factor loadings of individual items onto one factor found are presented in Table 3. The three factors found were:

AI autonomy anxiety. This factor includes 11 items that describe the anxiety towards AI taking over jobs and becoming autonomous

Learning anxiety. This factor includes nine items that describe the anxiety towards learning how to use AI

Dependency anxiety. This factor includes two items that describe the anxiety towards growing dependence on AI.

Table 3.4.4. Factor loadings, explained variance and reliability of the three factors found for the scale 'AI Anxiety'.

Item	AI autonomy anxiety	Learning anxiety	Dependency anxiety
I find humanoid AI techniques/products scary.	.90		
I find humanoid AI techniques/products intimidating.	.90		
I don't know why, but humanoid AI techniques/products scare me.	.89		
I am afraid of various problems potentially associated with an AI technique/product.	.77		
I am afraid that AI techniques/products will replace someone's job.	.72		
I am afraid that an AI technique/product may lead to AI autonomy.	.70		
I am afraid that an AI technique/product may get out of control and malfunction.	.67		

I am afraid that an AI technique/product may be misused.	.66		
I am afraid that widespread use of AI will take jobs away from people.	.63		(.37)
I am afraid that an AI technique/product may replace humans.	.54		(.37)
I am afraid that if I begin to use AI techniques/products I will become dependent upon them and lose some of my reasoning skills.	.48		(.36)
Learning to use specific functions of an AI technique/product makes me anxious.		.94	
Learning to use AI techniques/products makes me anxious.		.93	
Learning how an AI technique/product works makes me anxious.		.90	
Learning to interact with an AI technique/product makes me anxious.		.89	

Learning to understand all of the special functions associated with an AI technique/product makes me anxious.		.89	
Reading an AI technique/product manual makes me anxious.		.79	
Taking a class about the development of AI techniques/products makes me anxious.		.77	
Being unable to keep up with the advances associated with AI techniques/products makes me anxious.		.56	
I am afraid that an AI technique/product may make us even lazier.			.81
I am afraid that an AI technique/product may make us dependent.			.78
R^2	.44	.19	.07
Cronbach's α	.93	.94	.87

AI Uncanniness

To measure perceived AI uncanniness, the Negative Attitudes toward Robots with Human Traits (NARHT) subscale was adopted (Łupkowski & Gierszewska, 2019, p. 103-104). This is part of the Negative Attitudes toward Robots Scale (NARS) divided into different subscales to address more nuanced aspects of robot development, specifically those that target human-like traits. The NARTH subscale consists of 5 items. Three items pertain to negative perception of AI uncanniness and two items pertain to positive perception of AI uncanniness. These items have been developed through numerous factor analyses of the NARS (Pochwatko et al, 2015, p. 69). The Cronbach's alpha of the NARHT scale is 0.77 (Łupkowski & Gierszewska, 2019, p. 106) which makes it a reliable and suitable scale to use in this thesis. All five items were used in this thesis. These items were rated on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree) (originally a 5-point likert). The reliability analysis of this thesis revealed that Cronbach's alpha was .15. This is therefore not considered to be a reliable scale (Pallant, 2020, p. 102).

The 5 items which were Likert-scale based were entered into an exploratory factor analysis using Principal Components extraction with Direct Oblimin rotation based on Eigenvalues (> 1.00), KMO = .69, $\chi 2$ (N = 154, 10) = 230.14, $p < .001$. The resultant model explained 73.1% of the variance in AI uncanniness measures. Factor loadings of individual items onto one factor found are presented in Table 5. The two factors found were:

Negative perception of AI uncanniness. This factor had three items that pertain to negative perception of AI Uncanniness.

Positive perception of AI uncanniness. This factor had two items that pertain to positive perception of AI Uncanniness.

Table 3.4.5. Factor loadings, explained variance and reliability of the two factors found for the scale 'AI Uncanniness'.

Item	Negative perception	Positive perception
Something bad might happen if AI developed into living beings.	.85	
I would feel uneasy if AI really had emotions	.81	
I would hate the idea that AI were making judgments about things.	.76	
If AI had emotions, I would be able to make friends with them.		.92
I feel comforted being with AI that have emotions.		.87
R^2	.51	.22
Cronbach's α	.75	.77

AI uncanniness as a whole scale had an unreliable Cronbach's alpha value of .15. The original scale used the NARTH scale as one whole, however, after completing the factor analysis, it was found that it is acceptable to test the two factors derived from the scale as two separate variables. Therefore the two new variables are:

Negative perception of AI uncanniness (α = .79, M = 5.14, SD = 1.31). This factor includes items *'I would feel uneasy if AI really had emotions.'*, *'Something bad might happen if AI developed into living beings'* and *'I would hate the idea that AI were making judgments about things'*.

Positive perception of AI uncanniness (α = .77, M = 3.33, SD = 1.51). This factor includes items *'I feel comforted being with AI that have emotions'* and *'If AI had emotions, I would be able to make friends with them'*.

3.5 Analysis Methods

To test the different variables and their interactions with one another, the hypotheses will be tested using different regression analyses. A regression analysis is used when a continuous independent variable gets tested against a few continuous independent variables. In this case, H1 and H2, H3 and H4, H8 and H9 will be tested using multiple regression analysis as the independent variables in these hypotheses are interrelated with each other to explain one variable (Pallant, 2020, p. 153). Therefore, it is logical to explore these relationships in one regression.

To test the moderating effects of personal innovativeness, it is appropriate to use a different test. A moderator influences the relationship between the independent and dependent variables. The influence can be presented through strength, direction or presence of any relationship (Hayes, 2012, p. 1). It can also test the effects of the moderator across varying levels of the moderator presence. To test this, a system called PROCESS which was installed as an extension on the IBM SPSS system.

4 Results

This section of the thesis will focus on reporting on the findings from the data. The data was inputted into the IBM SPSS software in order to perform necessary tests that will aid in answering the hypotheses presented in section 2 of this thesis. The chapter will start with hypothesis testing. This was done using regression analysis which will answer hypotheses 1, 2, 3, 4, 5, 8 and 9. The chapter will finish with a moderation analysis to answer hypotheses 7 and 6.

4.1 Direct Effect of AI Literacy and AI Self-Efficacy on AI Anxiety

A multiple linear regression was conducted with AI anxiety as a dependent variable. Predictors were AI literacy and AI self-efficacy. The model was found to be significant. $F(2, 151) = 4.02$, p .020, $R^2 = .05$. AI literacy, $\beta^* = -.23$, $t = -2.81$, $p = .006$, 95% *CI* [-.51, -.09] was found to be a significant negative predictor of AI anxiety indicating that higher levels of AI literacy are associated with lower levels of AI anxiety. It suggests that for every one-unit increase in AI literacy, AI anxiety decreases by .30 units. For these effects, it is assumed that other independent variables remain the same. The result of this regression thereby, offers support for H1. However, AI self-efficacy, $\beta^* = .06$, $t = .77$, $p = .445$, 95% *CI* [-.11, -.26]) was found to be an insignificant positive predictor of AI anxiety. It suggests that for every one-unit increase in AI literacy, AI anxiety increases by .07 units. This regression does not support the hypothesis that higher levels of AI self-efficacy results in lower AI anxiety. Therefore the result of this regression results in rejecting H2.

Table 4.1. Regression Analysis: predicting AI Anxiety

Effect	Estimate	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	5.24	.672	3.91	6.57	<.001
AI Literacy	-.301	.107	-.513	-.089	.006
AI Self-Efficacy	.072	.094	-.113	.257	.445

Note. Number of studies = 1, number of effects = 2, total $N = 154$. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

4.2 Direct Effect of AI Literacy and AI Self-Efficacy on Personal Innovativeness

A multiple linear regression was conducted with personal innovativeness as a dependent variable. Predictors were AI literacy and AI self-efficacy. The model was found to be significant, $F(2, 151) = 49.4$, $p < .001$, $R^2 = .39$. AI literacy, $\beta^* = .64$, $t = 9.93$, $p < .001$, 95% *CI* [.88, 1.31] was found to be a significant positive predictor of personal innovativeness indicating that higher levels of AI literacy are associated with higher levels of personal innovativeness. It suggests that for every one-unit increase in AI literacy, personal innovativeness increases by 1.10 units. For these effects, it is assumed that other independent variables remain the same. The result of this regression thereby, offers support for H3. However, AI self-efficacy, $\beta^* = -.06$, $t = -.89$, $p = .376$, 95% *CI* [-.28, .11] was found to be an insignificant negative predictor of personal innovativeness. It suggests that for every one-unit increase in AI self-efficacy, personal innovativeness decreases by .89 units. This regression does not support the hypothesis that higher levels of AI self-efficacy results in higher personal innovativeness. Therefore the result of this regression results in rejecting H4.

Table 4.2. Regression Analysis: predicting Personal Innovativeness

Effect	Estimate	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	-.361	.691	-1.73	1.01	.602
AI Literacy	1.09	.110	.877	1.31	<.001
AI Self-Efficacy	-.086	.097	-.276	.105	.376

Note. Number of studies = 1, number of effects = 2, total $N = 154$. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

4.3 Direct Effect of Personal Innovativeness on AI Anxiety

A linear regression was conducted with AI anxiety as a dependent variable. The predictor was personal innovativeness. The model was found to be significant. $F(1, 152) = 15.27$, $p < .001$, $R^2 = .09$. Personal innovativeness, $\beta^* = -.30$, $t = -3.91$, $p < .001$, 95% *CI* [-.59, -.19] was found to be a significant negative predictor of AI anxiety indicating that higher levels of personal innovativeness are associated with lower levels of AI anxiety. It suggests that for every one-unit increase in personal innovativeness, AI anxiety decreases by .39 units. The result of this regression thereby, offers support for H5.

Table 4.3. Regression Analysis: predicting AI Anxiety

Effect	Estimate	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	5.19	.299	4.59	5.78	<.001
Personal Innovativeness	-.234	.060	-.353	-.116	<.001

Note. Number of studies = 1, number of effects = 1, total $N = 154$. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

4.4 Direct Effect of Perceptions of AI Uncanniness on AI Anxiety

A multiple linear regression was conducted with AI anxiety as a dependent variable. Predictors were negative and positive perceptions of AI uncanniness. The model was found to be significant, $F(2, 151) = 42.49$, $p < .001$, $R^2 = .35$. Negative perception towards AI, $\beta^* = .61$, $t = 8.67$, $p < .001$, 95% *CI* [.40, .63] was found to be a significant positive predictor of AI anxiety indicating that higher levels of negative perception towards AI uncanniness are associated with higher levels of AI anxiety. It suggests that for every one-unit increase in negative perception towards AI, AI anxiety increases by .51 units. For these effects, it is assumed that other independent variables remain the same. The result of this regression thereby, offers support for H8. However, positive perception towards AI uncanniness, $\beta^* = .04$, $t = .52$, $p = .606$, 95% *CI* [-.08, .13] was found to be an insignificant positive predictor of AI anxiety. This regression does not support the hypothesis that higher levels of positive perceptions towards AI uncanniness results in lower AI anxiety. It suggests that for every

one-unit increase in positive perception towards AI uncanniness, AI anxiety increases by .03 units. Therefore the result of this regression results in rejecting H9.

Table 4.4. Regression Analysis: predicting AI Anxiety

Effect	Estimate	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	1.34	.410	.529	2.15	.001
Negative Uncanniness Perception	.513	.059	.396	.630	<.001
Positive Uncanniness Perception	.027	.051	-.075	.128	.606

Note. Number of studies = 1, number of effects = 2, total $N = 154$. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

4.5 Moderation Effect of Personal Innovativeness

A moderation analysis was conducted using Hayes' (2013) PROCESS macro. The independent variable was AI Literacy. Personal innovativeness was entered as a moderator, and AI anxiety as the dependent variable. The overall model was significant $F(3, 150) = 6.89$, $p < .001$, $R^2 = .12$. The moderator result showed that personal innovativeness significantly moderated the relationship between AI literacy and AI anxiety (β = .15, SE = .07, $p = .029$). Thereby offering support for H6. Simple slopes for the association between AI literacy and AI anxiety were tested for low (-1SD below the mean), moderate (mean), and high (+1 SD above the mean) levels of personal innovativeness. The Johnson-Neyman slope analysis effects can be seen in Table 4.5.2. It showed that at the below the mean levels of personal innovativeness (-1SD), AI literacy did not significantly predict AI anxiety (β = -.25, SE = 0.16, $p = .107$). It also reveals that at the above the mean levels of personal innovativeness (+1SD), AI literacy did not significantly predict AI anxiety (β = .16, SE = .17, $p = .335$).

Table 4.5.1. Moderation Effect of Personal Innovativeness

Effect	Estimate	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	3.95	.096	3.77	4.15	.000
AI Literacy	-.049	.132	-.309	.210	.708
Personal Innovativeness	-.19	.077	-.342	-.039	.014
AI Literacy x Personal Innovativeness	.148	.067	.016	.28	.029

Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

Table 4.5.2. Conditional Effects of AI Anxiety

Social Support	Effect	*SE*	*t*	96% CI		*p*
				LL	*UL*	
-1 *SD*	-.258	.159	-1.62	-.572	.057	.107
Mean	-.049	.131	-.375	-.309	.21	.708
+1 *SD*	.159	.165	.968	-.166	.484	.335

Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

A moderation analysis was conducted using Hayes' (2013) PROCESS macro. The independent variable was AI Self-Efficacy. Personal innovativeness was entered as a moderator, and AI anxiety as the dependent variable. The overall model was significant $F(3, 150) = 5.61$, $p = .001$, $R^2 = .10$. The moderation result showed that personal innovativeness insignificantly moderated the relationship between AI literacy and AI anxiety ($\beta = .08$, SE = .06, $p = .247$). Thereby rejecting H7.

Table 4.5.3. Moderation Effect of Personal Innovativeness

Effect	Estimate	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	4.06	.084	3.89	4.23	.000
AI Self-Efficacy	.014	.095	-.174	.201	.886
Personal Innovativeness	-.241	.060	-.360	-.122	.000
AI Self-Efficacy x Personal Innovativeness	.075	.065	-.053	.202	.247

Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

Table 4.6. Hypotheses Results on Research Model

Hypothesis	Result
H1: AI literacy is negatively associated with AI anxiety.	Accepted
H2: AI self-efficacy is negatively associated with AI anxiety.	Rejected
H3: AI literacy is positively associated with personal innovativeness.	Accepted
H4: AI self-efficacy is positively associated with personal innovativeness.	Rejected
H5: Personal innovativeness is negatively associated with AI anxiety.	Accepted
H6: Personal innovativeness will strengthen the negative relationship between AI literacy and AI anxiety.	Accepted
H7: Personal innovativeness will strengthen the negative relationship between AI self-efficacy and AI anxiety.	Rejected
H8: Negative attitude towards AI uncanniness is positively associated with AI anxiety.	Accepted
H9: Positive attitude towards AI uncanniness is negatively associated with AI anxiety.	Rejected

5 Discussion and Conclusion

This chapter aims to explore and conclude the findings that have been derived from the research performed in this thesis. The chapter will start by discussing the main findings found from chapter 4 of the thesis. The chapter will continue on to concluding several aspects of the thesis such as the limitations, implications and future research suggestions.

5.1 Discussion of Findings

The main aim of this thesis was to find a suitable answer to the research question "To what extent does artificial intelligence (AI) literacy, self-efficacy and the perception towards uncanniness of AI interface affect the anxiety towards AI and is moderated by innovativeness amongst adults?". It was found that participants with higher AI literacy are more likely to have lower AI anxiety as well as this relationship likely being strengthened by presence of high personal innovativeness. It was also observed that participants with higher negative perception of AI uncanniness are more likely to have higher AI anxiety. However, there was also a set of hypotheses that were not supported by the results. It was observed that, although insignificantly, AI self-efficacy is a positive predictor of AI anxiety. This pattern was also observed when predicting personal innovativeness. Following that, personal innovativeness was not a significant moderator between the AI self-efficacy and AI anxiety. Lastly, it was observed that participants with higher positive perception of AI uncanniness are still likely to experience AI anxiety. This section will focus on discussing the outcome of each hypothesis in detail in order to come to an accurate answer to the research question of this thesis.

5.1.1 Direct Effects of AI Literacy and AI Self-Efficacy on AI Anxiety

It was confirmed that participants with higher AI literacy are more likely to have lower AI anxiety. This was predicted earlier using existing research which showed that AI literacy can increase adoption of technology and lower anxiety surrounding it (Schiavo et al, 2024, p. 8). Previous research showed that a positive attitude towards AI technology was predicted by knowledge and use of the technology (Kaya et al, 2024, p. 507). Therefore, this explains that individuals with higher AI literacy can have lower AI anxiety.

However, it did not support the hypothesis that participants with higher AI self-efficacy are more likely to have lower AI anxiety. With more research, it was found that this could have been the outcome due to the fact that AI self-efficacy does not account for actual knowledge about AI but rather motivation about considering to use it (Hong, 2022, p. 184). The result showed that higher AI self-efficacy resulted in an increase of AI anxiety.

This result was also insignificant. Therefore, it is not an accurate predictor of AI anxiety, positive or negative.

This could also be due to the nature of the scale where individuals had to place themselves in a situation with AI and due to the target population being the general public, it did not account for the fact that some people may never have used AI. Therefore, there is a prediction that individuals may have thought that they had the ability to use AI but in turn, when asked about threats of AI, they felt that they did have anxiety about it.

5.1.2 Direct Effects of AI Literacy and AI Self-Efficacy on Personal Innovativeness and Personal Innovativeness on AI Anxiety.

Personal innovativeness was chosen as a moderating variable in this research through the application of Diffusion of Innovation theory. The theory focuses on the process of introducing innovations into the public. The theory also explores that there are in fact different groups of individuals who respond to the technology at different rates. This theory inspired the thought that perhaps an individuals' eagerness does play a role in how they feel about new technology. Therefore, with additional research, it was found that innovators, one of the five groups of adopters outlined by Evertt Rogers (Rogers, 2003, p. 248-250), had shown in research to have great effects on accepting technology (Lu et al, 2005, p. 251).

It was found that individuals with higher AI literacy are more likely to have higher personal innovativeness which suggests that people with higher literacy of a topic could also be innovators in the topic. However, participants with higher self-efficacy have shown that it is likely to have lower personal innovativeness. This was an unexpected result as research has shown that people who are confident in their abilities to interact with technology, tend to be motivated to try out that technology (Hong, 2022, p. 184). With this result it can be suggested that individuals who have never tried out a technology before, may still feel like they are able to but are not as proactive about it and therefore are not considering themselves as innovators.

Regarding direct effects of personal innovativeness on AI anxiety, as predicted, it was proven that participants with higher personal innovativeness are more likely to have lower AI anxiety. Referring back to the Diffusion of Innovation theory, it is shown that innovators have the tendency to "cope with the high degree of uncertainty about an innovation at the time that the innovator adopts" (Rogers, 2003, p. 248). Therefore, it is evident that innovators have a low sense of anxiety towards AI as they are aware that the technology is new and can have unpredictable outcomes but due to the nature of the individual, they do not see this as a threat.

5.1.3 Direct Effects of Perceptions of AI Uncanniness on AI Anxiety.

As predicted, participants with higher negative perception towards AI uncanniness are more likely to have higher AI anxiety. This has also been previously proven in research which suggested that human-like attributes in AI are not perceived well by individuals (Brédart, 2021, p. 35). This was also observed in the theory of the Uncanny Valley where likeability of a human-like technology drops with the increase of human-like attributes (Mori, 2012, para. 2).

However, participants with higher positive perception towards AI uncanniness are also more likely to have higher AI anxiety therefore showcasing that positive perception may still result in AI anxiety. To further explain this, it is important to note that this relationship was proven to be insignificant. However, it is interesting to also point out that the beta coefficient was only .03 which indicates a very low per-unit change between the variables. Though this was an insignificant relationship, the presence of the positive beta coefficient leads to the belief that individuals can feel positively towards hypothetical AI uncanniness but when asked about their overall anxiety towards using AI, they may feel differently due to the fact that it is more than just AI uncanniness fear and that it is a real threat (Lemay, 2020, p. 30) rather than a hypothetical interaction with uncanny AI. Though this outcome has not been seen in other research surrounding perception of AI uncanniness, it can be suggested that there are psychological theories, such as affective forecasting (Wilson & Gilbert, 2003, p. 377), that could explain hypothetical perception over real interactions with fears.

5.1.4 Moderating Effects of Personal Innovativeness between AI Literacy and AI Self-Efficacy on AI Anxiety.

Personal Innovativeness was presented as a significant, positive moderator which strengthened the negative relationship between AI literacy and AI anxiety. The moderating role of personal innovativeness has been explored in research surrounding adoption of mobile learning and technology acceptance (Cheng, 2014, p. 56). It was shown that personal innovativeness was seen as a significant moderator in predicting relationships pertaining to new technological adoption. It is evident that in the previous research (Rogers, 2003, p. 248; Chen, 2022, p.4; Park & Woo, 2022, p. 80) as well as this thesis that personal innovativeness amongst individuals plays an important role when it comes to new technological advancements. It is therefore important to take into account individuals' levels of personal innovativeness when marketing and distributing new technologies into the general public.

The results showed that with every increase of personal innovativeness, the relationship between AI self-efficacy and AI anxiety was stronger. However this relationship was insignificant. This insignificance can be explained with the overall insignificance that is present when the independent variable is AI self-efficacy. The limitation of this variable could be that the scale was developed on the basis of hypothetical scenarios that the participants had to answer on. Though the overall Cronbach's alpha of the scale was high (.80), the item to item correlation was relatively low as nine out of ten items correlated below 0.5. Therefore, this could explain the insignificant results.

5.2 Limitations

The first limitation of this study is the sample size. Though it was an adequate amount for this thesis (N=154), it was not as extensive as it could have been. This is a present limitation due to time constraints that were present when conducting the thesis research. Another factor of this is that the survey was deployed on survey sharing sites which tend to have unpredictable result rates. Combining this with the existing time limitations, it was important for the researcher to have a good and complete sample which would be adequate to answer the research question. However, it is recognised and suggested that a bigger sample size would only increase the quality of the research as it would capture a bigger population (Kotrlik & Higgins, 2001, p. 50).

The second limitation of this study is the method chosen for this research. The goal of this research was to gain insights about AI literacy and anxiety from individuals that have a varying level of understanding of AI in order to get a more accurate depiction of what the general population thinks about AI. This research was done online through deployment of an online survey. There is therefore a possibility that individuals who aren't actively online or on survey sharing sites may have missed the opportunity to participate in the research. A way in which the scope could have been increased if through deployment of the survey through offline channels such as random participants on the street. This could then attract a different sample of individuals who are not using technology a lot or perhaps are not on survey sharing websites. This, therefore, might give a more well-rounded answer to the research question at hand which aims to explain AI literacy and anxiety amongst the general population.

A critical limitation is also that online surveys tend to receive low response rates. This is due to several other factors such as disregarding messages from researchers or feeling that there is a lack of personal connection to the researcher (Evans & Mathur, 2018, p. 859). Therefore, there is little motivation to complete the survey. This will be eliminated by using survey deploying websites such as Prolific and SurveyCircle that are aimed for survey distribution. Therefore, users of these platforms are focused and equipped to complete online surveys. Other limitations include unclear instructions which are aimed to be combated by pre-testing the survey on 3 people of different age ranges to make sure that the instructions and vocabulary is understood before deploying the survey.

The final limitation of this study is the partial validity issues that were presented in section 4 of the thesis. Prior to selecting scales for the online survey, each scale was researched in order to ensure that it is tested and validated. This was ensured in order to increase the validity and reliability of this thesis. However, during the data analysis section of the thesis, it was showcased that even highly reliable scales with a large Chronbach's alpha value were shown to have unreliable results. Therefore, the certain items had to be omitted in order to continue the data analysis. This limitation could have arisen from poor understanding of the items by the participants or from a lack of concentration from the participants when answering the questions. Certain ways to avoid this for future studies is to ensure that items are understood by pre-testing the survey on a group of people. Next, it can be useful to add attention checks in order to ensure that people are not clicking on random answers. Lastly, items can be organised in a way that would make it easier for participants to read.

5.3 Implications

This study provides significant and well-rounded insights for understanding the gap between AI literacy, AI self-efficacy, AI anxiety, personal innovativeness and perception of uncanniness. These insights combined create a potential starting point for the development of various support systems in regards to AI acquisition. Starting off with AI literacy and AI self-efficacy, this research can be used to confirm that having a high level of literacy in regards to AI can change the negative emotions that develop from AI. Therefore, it is crucial to develop methods of educating the general public on AI and it's uses in order to lower fears surrounding the topic. AI anxiety has been found to be derived from various other predictors, therefore it is also useful to implement support systems surrounding lowering AI anxiety or creating spaces in which these anxieties can be addressed in order to the general public to have an easier transition in accepting the existence and presence of AI in various sectors of

life and work. These education methods can be implemented in various sectors and stages. From the core stage of adapting the education system to a more niche sector where onsite training within companies can take place in order to lower AI anxiety amongst the workforce.

The findings developed surrounding perception towards AI uncanniness can be useful for companies that use AI as a means to communicate with their customers. It is observed that negative perceptions towards AI uncanniness ultimately result in increased AI anxiety. This can be damaging to companies that opt to replace human customer services representatives with AI bots as this may increase AI anxiety amongst the customers and therefore result in negative brand perceptions. This information can also be adopted by AI developers who may use this information to reevaluate the readiness that the public has towards realistic AI interfaces. Therefore this paper is important for the development and deployment of AI into the general public as it is evident that there is a strong connection between negative perception of uncanniness and AI anxiety.

A final implication of this study is the development of a new research model that enables the research of the direct effects between AI literacy and AI anxiety. Previous research has shown that there might be a relationship between AI readiness and anxiety as well as acceptance and anxiety. However, there was no research done to show that there are preventive measures that can be implemented in order to lower anxiety surrounding AI. By delving into research surrounding AI literacy and anxiety, this model can be adopted to measure the effectiveness of teaching methods about AI. Therefore, this research holds great value in broadening the understanding of how implementation of AI affects the general public.

5.4 Future Research

Although this study does contain several limitations, it is important to note that there is also a great deal of implications that this study has on various work and life sectors. Therefore, there are different ways that this study can aid in future research. Firstly, it can be useful for there to be a study that is aimed at different demographics. Delving into gender differences or what effects nationality may have on AI interaction could be a useful research path in order to create tailored solutions to eliminating rates of AI anxiety and increase AI literacy. Demographics can be used as an addition to the existing model by adding these factors as moderators or this study can be developed into a comparative study. Both of these options would be building on the existing model.

Secondly, this research can be developed further by focusing on the perception of AI uncanniness. This can be done by implementing a visual aspect into the survey by asking respondents to interact with uncanny AI and measure their response to it. Research has shown that a visual aspect in a survey increases participant satisfaction (Guin et al, 2012, p. 625). Perhaps this could also aid in the attentiveness that the respondents will have whilst participating in the study.

Lastly, to engage further with the Diffusion of Innovation theory, a comparative study can be created to measure AI literacy and anxiety amongst the different adopters that were developed by Rogers (Rogers, 2003, p. 247). By creating an assessment that would determine what adopter category the participant is in, it would allow the researcher to compare results from the different adopter categories. This would then be useful to assess what other attributes the different adopters possess. The information from this study could not only develop the Diffusion of Innovation theory to gain better insights about individuals' predictors but also be useful to understand how different groups react to AI developments. Going back to implications, this type of study would be useful in various sectors such as education and marketing to understand different adopters' habits in regards to technological advancements.

In conclusion, the implications of this research display the importance of this research in various business and education contexts. Researching the implications of AI anxiety further can develop deeper insights into prevention of it which in turn will create a better synthesis between human and AI interaction. There are different paths that research into AI literacy and anxiety can take depending on other variables and demographics. Therefore, there are endless opportunities to develop this research further.

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Appendix

Appendix A. Full questionnaire.

Dear participant,

I am a Masters student at Erasmus University Rotterdam. I am conducting thesis research on AI anxiety. I am conducting this research independently. I will explain the study below. If you have any questions, please email the researcher: 676888dn@eur.nl
If you want to participate in the study, you can indicate this at the end of this form.

What is the research about?
The purpose of this thesis research is to investigate the effects of AI literacy and AI configuration on AI anxiety amongst adults.

What can you expect?
You can fill in the questionnaire yourself online. The questionnaire will take approximately 5 minutes to fill in. Please answer each question carefully and honestly, we are sincerely interested in your personal opinions. There are no right or wrong answers.

You decide whether to participate.
Participation in this study is completely voluntary. You can stop at any time and would not need to provide any explanation.

What are the potential risks and discomforts?
We do not anticipate any risks or discomforts while participating in this study.

What are the benefits of participating?
There are no immediate benefits for participating in the study, however, sharing your experiences will shed more light on the situation concerning AI anxiety.

What data will I ask you to provide?
During the survey, I will ask you about the following personal data: age, gender, nationality, occupation and race.

Who can see your data? / What will happen to my data?
- I store all your data securely.
- Only persons involved in the research can see the data.
- We will write an article about the results of the study which will be published (publicly share the results) in (academic) journals and/or books.
- The results will be accessible by anyone.

How long will your personal data be stored?
Your data will be retained for 10 years after completion of the research. We retain the data so that other researchers have the opportunity to verify that the research was conducted correctly.

Using your data for new research.
We will make anonymised data publicly available so that any interested person can use it. We ensure that the data cannot be traced back to you/we do not disclose anything that identifies you.

Do you have questions about the study?
If you have any questions about the study or your privacy rights, such as accessing, changing, deleting, or updating your data, please contact me.

Name: Daria Nekrasova
Email: 676888dn@eur.nl

Do you have a complaint or concerns about your privacy?
Please email the Data Protection Officer (fg@eur.nl) or
visit autoriteitpersoonsgegevens.nl (T: 088 - 1805250)

Do you regret your participation?
Until you submit the survey, you can still decide not to take part in the research. If you stop, your data will not be stored. After you click ‘send’, we cannot trace what data you have shared with us anymore.

Instructions:

1. Please answer each question honestly
2. Take your time to provide accurate information
3. This survey is completely anonymous, encouraging feedback

Are you aged 18 or over?

- ☐ Yes
- ☐ No

I have read the information letter. I understand what the study is about and what data will be collected from me. I was able to ask questions as well. My questions were adequately answered. By signing this form, I: consent to participate in this research; consent to the use of my personal data confirm that I am at least 18 years old.

- ☐ I agree
- ☐ I do not agree

The following questions will focus on your interaction with AI. To what extent do you agree with the following?

I can distinguish between AI and non-AI applications.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I do not know how AI technology can help me.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I can identify the AI technology employed in the applications and products I use.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I can skilfully use AI applications or products to help me with my daily work.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

It is usually hard for me to learn to use a new AI application or product.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I can use AI applications or products to improve my work efficiency.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I can evaluate the capabilities and limitations of an AI application or product after using it for a while.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I can choose a proper solution from various solutions provided by an AI.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I can choose the most appropriate AI application or product from a variety for a particular task.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I always comply with ethical principles when using AI applications or products.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I am never alert to privacy and information security issues when using AI applications or products.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I am always alert to the abuse of AI technology.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

The following statements related to your AI use. To what extent to you agree with the following statements? "In general, I could complete any desired task using the AI technology if…
there was no one around to tell me what to do as I go."

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I had never used technology like it before."

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I had only the manuals for reference."

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I had seen someone else using it before trying it myself."

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I could call someone for help if I get stuck."

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

someone else helped me get started."

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I had a lot of time to complete the task for which the technology was provided."

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I had just the built-in help facility for assistance."

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

someone showed me how to do it first."

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I had used similar technologies before this one to do the same task."

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

The following questions will focus on your personal innovativeness. To what extent do you agree with the following?

If I heard about a new AI technology, I would look for ways to experiment with it.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

Among my peers, I am usually the first to try out new AI technologies.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

In general, I am hesitant to try out new AI technologies.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I like to experiment with new AI technologies.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

The following questions will focus on your possible worries regarding AI. To what extent do you agree with the following?
Learning to understand all of the special functions associated with an AI technique/product makes me anxious.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

Learning to use AI techniques/products makes me anxious.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

Learning to use specific functions of an AI technique/product makes me anxious.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

Learning how an AI technique/product works makes me anxious.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

Learning to interact with an AI technique/product makes me anxious.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

Taking a class about the development of AI techniques/products makes me anxious.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

Reading an AI technique/product manual makes me anxious.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

Being unable to keep up with the advances associated with AI techniques/products makes me anxious.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I am afraid that an AI technique/product may make us dependent.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I am afraid that an AI technique/product may make us even lazier.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I am afraid that an AI technique/product may replace humans.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I am afraid that widespread use of AI will take jobs away from people.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I am afraid that if I begin to use AI techniques/products I will become dependent upon them and lose some of my reasoning skills.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I am afraid that AI techniques/products will replace someone's job.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I am afraid that an AI technique/product may be misused.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I am afraid of various problems potentially associated with an AI technique/product.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I am afraid that an AI technique/product may get out of control and malfunction.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I am afraid that an AI technique/product may lead to AI autonomy.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I find humanoid AI techniques/products scary.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I find humanoid AI techniques/products intimidating.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I find humanoid AI techniques/products intimidating.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

The following questions will focus on your perception of AI. To what extent do you agree with the following?

I would feel uneasy if AI really had emotions.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

Something bad might happen if AI developed into living beings.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

If AI had emotions, I would be able to make friends with them.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I feel comforted being with AI that have emotions.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

I would hate the idea that AI were making judgments about things.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Somewhat disagree
- ☐ Neither agree nor disagree
- ☐ Somewhat agree
- ☐ Agree
- ☐ Strongly Agree

How old are you?

What is your gender?

- ☐ Male
- ☐ Female
- ☐ Non-binary
- ☐ Prefer not to say

What is your nationality?

What is your ethnicity?

- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Native Hawaiian or Pacific Islander
- ☐ Other (please specify):

What is your highest level of education?

- ☐ High school diploma
- ☐ Associate's degree
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Professional degree
- ☐ Doctorate
- ☐ Other (please specify):

What is your occupation?

Debrief:

The purpose of this survey is to study the effects of AI literacy and AI uncanniness on the levels of AI anxiety experienced by adults and how personal innovativeness may moderate this relationship.

Please click the blue arrow to complete the survey!

Appendix B. Additional factor and reliability tests

Appendix B1. Original reliability test for AI Literacy

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I can distinguish between AI and non-AI applications.	49.08	30.548	.423	.395
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I do not know how AI technology can help me.	51.69	45.521	-.501	.627
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I can identify the AI technology employed in the applications and products I use.	49.35	29.706	.508	.371

The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I can skilfully use AI applications or products to help me with my daily work.	49.01	29.124	.442	.378
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - It is usually hard for me to learn to use a new AI application or product.	51.38	44.277	-.432	.615
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I can use AI applications or products to improve my work efficiency.	48.89	28.844	.497	.364
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I can evaluate the capabilities and limitations of an AI	48.89	32.478	.399	.416

application or product after using it for a while.				
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I can choose a proper solution from various solutions provided by an AI.	48.81	31.500	.538	.390
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I can choose the most appropriate AI application or product from a variety for a particular task.	49.03	29.666	.525	.368
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I always comply with ethical principles when using AI applications or products.	49.04	32.861	.214	.455

The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I am never alert to privacy and information security issues when using AI applications or products.	51.02	38.281	-.120	.557
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I am always alert to the abuse of AI technology.	49.22	32.382	.225	.451

Appendix B2. Original factor analysis for AI Literacy

Pattern Matrix[a]			
	Component		
	1	2	3
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I can use AI applications or products to improve my work efficiency.	.835		
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - It is usually hard for me to learn to use a new AI application or product.	-.791		
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I can skilfully use AI applications or products to help me with my daily work.	.791		
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I can choose the most appropriate AI application or product from a variety for a particular task.	.729		
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I can choose a proper solution from various solutions provided by an AI.	.727		
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I do not know how AI technology can help me.	-.709		

The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I can evaluate the capabilities and limitations of an AI application or product after using it for a while.	.572		
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I am always alert to the abuse of AI technology.		.784	
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I always comply with ethical principles when using AI applications or products.		.638	
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I am never alert to privacy and information security issues when using AI applications or products.		-.631	.336
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I can distinguish between AI and non-AI applications.			.802
The following questions will focus on your interaction with AI. To what extent do you agree with the following? - I can identify the AI technology employed in the applications and products I use.			.782
Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.			
a. Rotation converged in 4 iterations.			

Appendix B3. Original reliability test for Personal Innovativeness (PIIT)

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The following questions will focus on your personal innovativeness. To what extent do you agree with the following? - If I heard about a new AI technology, I would look for ways to experiment with it.	12.62	6.643	.545	-.445[a]
The following questions will focus on your personal innovativeness. To what extent do you agree with the following? - Among my peers, I am usually the first to try out new AI technologies.	13.62	5.530	.523	-.590[a]
The following questions will focus on your personal innovativeness. To what extent do you agree with the following? - In general, I am hesitant to try out new AI technologies.	14.36	17.893	-.551	.870

The following questions will focus on your personal innovativeness. To what extent do you agree with the following? - I like to experiment with new AI technologies.	12.69	6.161	.533	-.504[a]

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

Appendix B4. Original factor analysis for Personal Innovativeness (PIIT)

Component Matrix[a]	
	Component
	1
The following questions will focus on your personal innovativeness. To what extent do you agree with the following? - I like to experiment with new AI technologies.	.912
The following questions will focus on your personal innovativeness. To what extent do you agree with the following? - If I heard about a new AI technology, I would look for ways to experiment with it.	.882
The following questions will focus on your personal innovativeness. To what extent do you agree with the following? - Among my peers, I am usually the first to try out new AI technologies.	.824
The following questions will focus on your personal innovativeness. To what extent do you agree with the following? - In general, I am hesitant to try out new AI technologies.	-.720
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Appendix C - SPSS Output

AI Literacy:

Reliability Statistics	
Cronbach's Alpha	N of Items
.805	9

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.803	
Bartlett's Test of Sphericity	Approx. Chi-Square	475.198
	df	36
	Sig.	<.001

AI Self-Efficacy:

Reliability Statistics	
Cronbach's Alpha	N of Items
.802	10

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.840	
Bartlett's Test of Sphericity	Approx. Chi-Square	562.859
	df	45
	Sig.	<.001

AI Anxiety:

Reliability Statistics	
Cronbach's Alpha	N of Items
.934	21

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.899	
Bartlett's Test of Sphericity	Approx. Chi-Square	2944.790
	df	210
	Sig.	<.001

Innovativeness:

Reliability Statistics	
Cronbach's Alpha	N of Items
.870	3

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.719	
Bartlett's Test of Sphericity	Approx. Chi-Square	242.998
	df	3
	Sig.	<.001

Negative perception towards uncanniness:

Reliability Statistics	
Cronbach's Alpha	N of Items
.748	3

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.639	
Bartlett's Test of Sphericity	Approx. Chi-Square	122.825
	df	3
	Sig.	<.001

Positive perception towards uncanniness:

Reliability Statistics	
Cronbach's Alpha	N of Items
.766	2

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.500	
Bartlett's Test of Sphericity	Approx. Chi-Square	75.869
	df	1
	Sig.	<.001

Regressions:

H1: AI literacy is negatively associated with AI Anxiety - Accepted

H2: AI self-efficacy is negatively associated with AI Anxiety - Rejected

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.225[a]	.051	.038	1.07228	.051	4.016	2	151	.020

a. Predictors: (Constant), AISE, AILIT

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.235	2	4.618	4.016	.020[b]
	Residual	173.618	151	1.150		
	Total	182.853	153			

a. Dependent Variable: AIA

b. Predictors: (Constant), AISE, AILIT

Coefficients[a]

Model		Unstandardised Coefficients	Standardised Coefficients			
		B	Std. Error	Beta	t	Sig.
1	(Constant)	5.239	.672		7.800	<.001
	AILIT	-.301	.107	-.225	-2.811	.006
	AISE	.072	.094	.061	.766	.445
a. Dependent Variable: AIA						

H3: AI Literacy is positively associated with personal innovativeness - Accepted

H4: AI Self-Efficacy is positively associated with personal innovativeness - Rejected

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.629[a]	.396	.388	1.10340	.396	49.421	2	151	<.001
a. Predictors: (Constant), AISE, AILIT									

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	120.339	2	60.170	49.421	<.001[b]
	Residual	183.843	151	1.218		
	Total	304.182	153			

a. Dependent Variable: INN

b. Predictors: (Constant), AISE, AILIT

Coefficients[a]

Model		Unstandardised Coefficients	Standardised Coefficients			
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.361	.691		-.522	.602
	AILIT	1.095	.110	.635	9.927	<.001
	AISE	-.086	.097	-.057	-.888	.376

a. Dependent Variable: INN

H5: Personal innovativeness is negatively associated with AI anxiety - Accepted

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			
					R Square Change	F Change	df1	df2	Sig. F Change
1	.302[a]	.091	.085	1.04553	.091	15.273	1	152	<.001
a. Predictors: (Constant), INN									

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.695	1	16.695	15.273	<.001[b]
	Residual	166.158	152	1.093		
	Total	182.853	153			
a. Dependent Variable: AIA						
b. Predictors: (Constant), INN						

Coefficients[a]

Model		Unstandardised Coefficients	Standardised Coefficients			
		B	Std. Error	Beta	t	Sig.
1	(Constant)	5.185	.299		17.334	<.001
	INN	-.234	.060	-.302	-3.908	<.001
a. Dependent Variable: AIA						

H8: Negative attitude towards AI uncanniness is positively associated with AI anxiety

H9: Positive attitude towards AI uncanniness is negatively associated with AI anxiety

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.600[a]	.360	.352	.88027	.360	42.488	2	151	<.001

a. Predictors: (Constant), PNARTH, NNARTH

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	65.846	2	32.923	42.488	<.001[b]
	Residual	117.007	151	.775		
	Total	182.853	153			

a. Dependent Variable: AIA

b. Predictors: (Constant), PNARTH, NNARTH

Coefficients[a]						
Model		Unstandardised Coefficients	Standardised Coefficients	Beta	t	Sig.
		B	Std. Error			
1	(Constant)	1.339	.410		3.267	.001
	NNARTH	.513	.059	.614	8.667	<.001
	PNARTH	.027	.051	.037	.517	.606
a. Dependent Variable: AIA						

Moderation:

H6: Personal innovativeness will strengthen the negative relationship between AI literacy and AI anxiety. - Accepted

Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 4.2 *****************

Written by Andrew F. Hayes, Ph.D. www.afhayes.com

Documentation available in Hayes (2022). www.guilford.com/p/hayes3

****

Model : 1

Y : AIA

X : AILIT

W : INN

Sample

Size: 154

****

OUTCOME VARIABLE:

AIA

Model Summary

R	R-sq	MSE	F	df1	df2	p
.3479	.1211	1.0714	6.8868	3.0000	150.0000	.0002

Model

	coeff	se	t	p	LLCI	ULCI

constant	3.9573	.0963	41.1087	.0000	3.7671	4.1475
AILIT	-.0493	.1315	-.3753	.7080	-.3091	.2104
INN	-.1904	.0768	-2.4783	.0143	-.3421	-.0386
Int_1	.1479	.0670	2.2074	.0288	.0155	.2803

Product terms key:

Int_1 : AILIT x INN

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.0286	4.8727	1.0000	150.0000	.0288

Focal predict: AILIT (X)

Mod var: INN (W)

Conditional effects of the focal predictor at values of the moderator(s):

INN	Effect	se	t	p	LLCI	ULCI
-1.4100	-.2579	.1591	-1.6204	.1072	-.5723	.0566
.0000	-.0493	.1315	-.3753	.7080	-.3091	.2104
1.4100	.1592	.1646	.9675	.3349	-.1660	.4844

Moderator value(s) defining Johnson-Neyman significance region(s):

Value	% below	% above
-2.3768	7.1429	92.8571

Conditional effect of focal predictor at values of the moderator:

INN	Effect	se	t	p	LLCI	ULCI
-3.7879	-.6096	.2817	-2.1642	.0320	-1.1662	-.0530
-3.4879	-.5652	.2641	-2.1405	.0339	-1.0870	-.0435
-3.1879	-.5209	.2468	-2.1102	.0365	-1.0086	-.0332
-2.8879	-.4765	.2301	-2.0712	.0401	-.9310	-.0219
-2.5879	-.4321	.2139	-2.0205	.0451	-.8547	-.0095
-2.3768	-.4009	.2029	-1.9759	.0500	-.8018	.0000
-2.2879	-.3877	.1984	-1.9545	.0525	-.7797	.0043
-1.9879	-.3434	.1838	-1.8681	.0637	-.7065	.0198
-1.6879	-.2990	.1704	-1.7551	.0813	-.6356	.0376
-1.3879	-.2546	.1583	-1.6083	.1099	-.5674	.0582
-1.0879	-.2102	.1480	-1.4202	.1576	-.5028	.0823
-.7879	-.1659	.1399	-1.1855	.2377	-.4423	.1106

-.4879	-.1215	.1343	-.9044	.3672	-.3869	.1439
-.1879	-.0771	.1316	-.5860	.5588	-.3372	.1829
.1121	-.0327	.1319	-.2482	.8043	-.2934	.2279
.4121	.0116	.1353	.0859	.9316	-.2557	.2789
.7121	.0560	.1414	.3960	.6927	-.2234	.3354
1.0121	.1004	.1500	.6690	.5045	-.1961	.3968
1.3121	.1447	.1607	.9007	.3692	-.1728	.4623
1.6121	.1891	.1731	1.0927	.2763	-.1529	.5311
1.9121	.2335	.1868	1.2501	.2132	-.1356	.6026
2.2121	.2779	.2016	1.3785	.1701	-.1204	.6761

Data for visualizing the conditional effect of the focal predictor:

Paste text below into a SPSS syntax window and execute to produce plot.

```
DATA LIST FREE/
  AILIT     INN       AIA       .
BEGIN DATA.
    -.8172   -1.4100    4.4365
     .0000   -1.4100    4.2257
     .8172   -1.4100    4.0150
    -.8172     .0000    3.9976
     .0000     .0000    3.9573
     .8172     .0000    3.9170
    -.8172    1.4100    3.5588
     .0000    1.4100    3.6889
     .8172    1.4100    3.8190
END DATA.
GRAPH/SCATTERPLOT=
 AILIT   WITH    AIA     BY      INN     .
```

********** ANALYSIS NOTES AND ERRORS **********

Level of confidence for all confidence intervals in output:

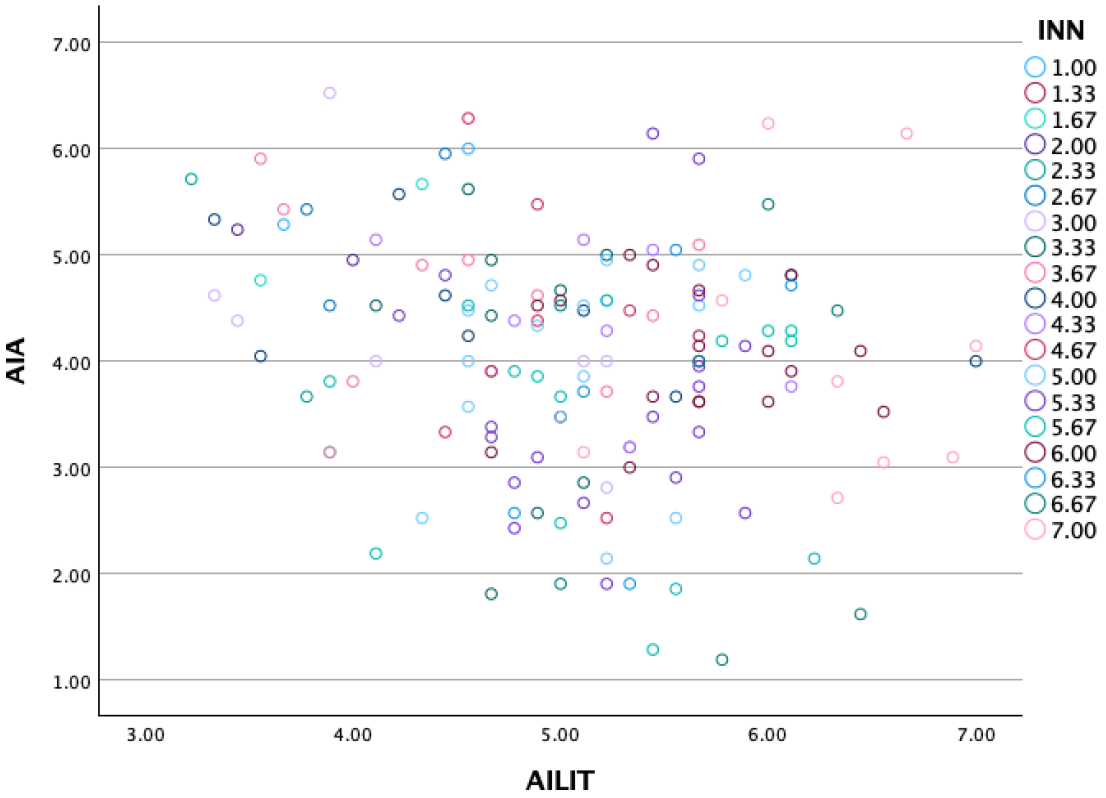
95.0000

W values in conditional tables are the mean and +/- SD from the mean.

NOTE: The following variables were mean centered prior to analysis:

INN AILIT

------ END MATRIX -----


INN
1.00
1.33
1.67
2.00
2.33
2.67
3.00
3.33
3.67
4.00
4.33
4.67
5.00
5.33
5.67
6.00
6.33
6.67
7.00
AIA
7.00
6.00
5.00
4.00
3.00
2.00
1.00
3.00
4.00
5.00
6.00
7.00
AILIT

H7: Personal innovativeness will strengthen the negative relationship between AI self-efficacy and AI anxiety. - Rejected

Run MATRIX procedure:

```
***************** PROCESS Procedure for SPSS Version 4.2 *****************

        Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2022). www.guilford.com/p/hayes3

**************************************************************************
Model  : 1
    Y  : AIA
    X  : AISE
    W  : INN
Sample
Size:  154
**************************************************************************
OUTCOME VARIABLE:
 AIA
Model Summary
          R       R-sq        MSE          F          df1        df2          p
      .3177      .1010     1.0960     5.6144     3.0000   150.0000      .0011
Model
                coeff         se          t          p       LLCI      ULCI
constant     4.0600      .0844    48.0976      .0000     3.8932     4.2268
AISE          .0136      .0949     .1434      .8862     -.1740      .2012
INN          -.2414      .0603    -4.0045      .0001     -.3606     -.1223
Int_1         .0750      .0646     1.1619      .2471     -.0525      .2025
Product terms key:
 Int_1    :       AISE     x       INN
Test(s) of highest order unconditional interaction(s):
           R2-chng          F        df1        df2          p
X*W          .0081     1.3500     1.0000   150.0000      .2471
----------
    Focal predict: AISE     (X)
          Mod var: INN      (W)
Data for visualizing the conditional effect of the focal predictor:
```

Paste text below into a SPSS syntax window and execute to produce plot.

```
DATA LIST FREE/
  AISE      INN       AIA       .
BEGIN DATA.
    -.9337   -1.4100    4.4864
     .0000   -1.4100    4.4004
     .9337   -1.4100    4.3144
    -.9337     .0000    4.0473
     .0000     .0000    4.0600
     .9337     .0000    4.0727
    -.9337    1.4100    3.6081
     .0000    1.4100    3.7196
     .9337    1.4100    3.8310
END DATA.
GRAPH/SCATTERPLOT=
 AISE    WITH    AIA     BY      INN     .
```

********** ANALYSIS NOTES AND ERRORS **********

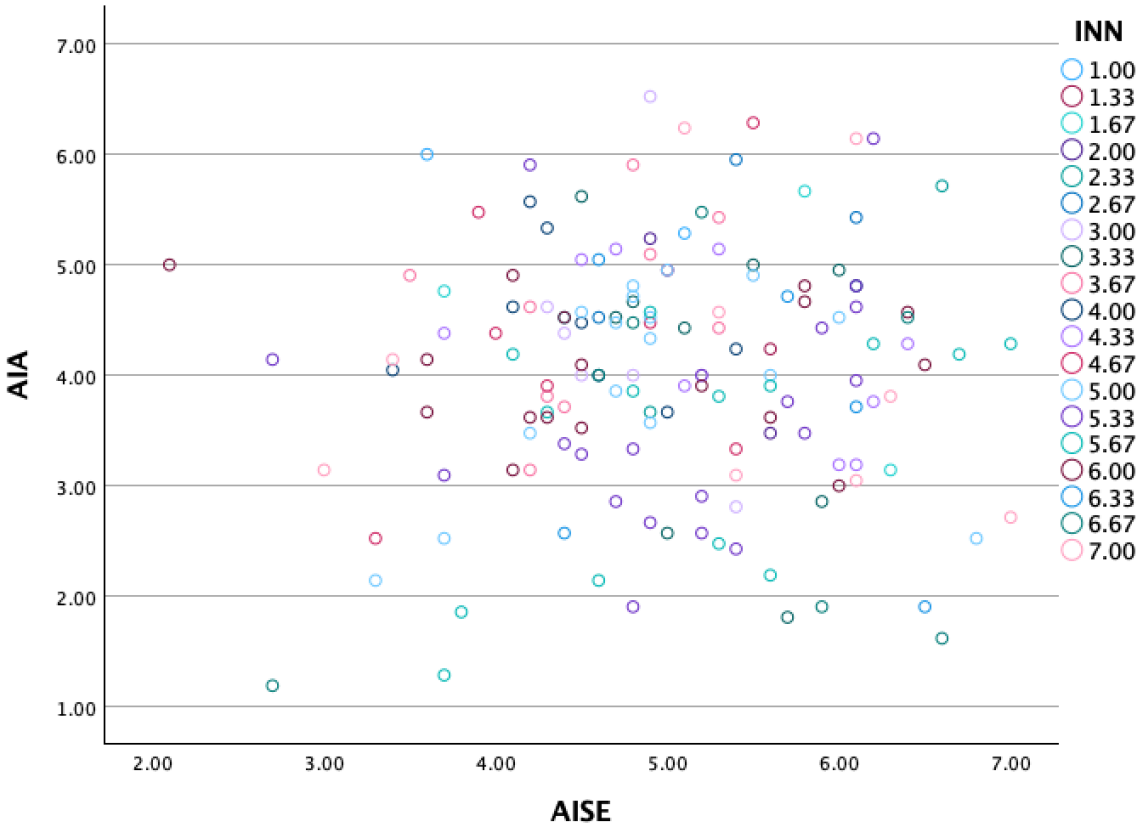
Level of confidence for all confidence intervals in output:

 95.0000

NOTE: The following variables were mean centered prior to analysis:

        INN   AISE

------ END MATRIX -----


INN
1.00
1.33
1.67
2.00
2.33
2.67
3.00
3.33
3.67
4.00
4.33
4.67
5.00
5.33
5.67
6.00
6.33
6.67
7.00
AIA
7.00
6.00
5.00
4.00
3.00
2.00
1.00
AISE
2.00
3.00
4.00
5.00
6.00
7.00

Appendix D - AI usage examples

Below are some examples of questions that were answered using ChatGPT:

1. Is there a difference between literacy and competance?
2. What is the difference between AI literacy and digital competance?
3. Can you suggest a model that explains that knowledge of something makes you less afraid of it?
4. Can you explain AI anthropomorphism?
5. Can you conceptually explain the artificial intelligence anxiety model?
6. Should I put questions regarding the dv, iv and moderator in a particular order in a survey?
7. What to include in the participants section of a thesis?
8. Do I have to do a factor analysis for every variable used in my thesis?
9. Is a p value of 0.0154 significant?
10. What does this mean AI literacy is negatively associated with AI Anxiety? what spss stats should i look for to confirm this?
11. Is ai literacy a categorical or continuous variable?
12. How to structure discussion section of thesis?