

Optimal Decision-Making in Life Insurance Purchasing Behaviour in Malaysia

by

Gan Jia Wei
(22010007)



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DECLARATION

I hereby declare that the work presented in this thesis was conducted in full compliance with the regulations of Universiti Malaysia Sarawak (UNIMAS). Except where proper acknowledgment is given, this work is solely the effort of the author. This thesis has not been accepted for the award of any other degree and is not being **concurrently** submitted for any other academic qualification.

Signature G.J.W
Student Name: Gan Jia Wei
Matric No: 22010007
Date: 02 December 2025

Faculty of Economics and Business
Universiti Malaysia Sarawak (UNIMAS)

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Optimal Decision-Making in Life Insurance Purchasing Behaviour in Malaysia

ABSTRACT

In Malaysia, the life insurance penetration rate is still low compared to nations like Taiwan, Japan, and Thailand, indicating a gap in coverage and financial preparedness. This study examined the moderating role of hyperbolic discounting on optimal decisions of life insurance purchasing behaviour and investigated the influences of attitude, subjective norm, perceived behavioural control, financial literacy, and perceived risk through the mediating role of intention. The theory of planned behaviour with the hyperbolic discounting model has been integrated in this study. This study utilised an online survey-based methodology, collecting data from Malaysian households using convenience and snowball sampling. The survey yielded 304 responses and was selected for analysis through structural equation modelling. The results discovered that subjective norms, perceived behavioural control, financial literacy, and perceived risk influenced optimal decisions of life insurance purchasing behaviour. There was a mediating role of intention for the relationships between attitude towards life insurance, perceived behavioural control, financial literacy, and optimal decisions of life insurance purchasing behaviour; however, hyperbolic discounting did not demonstrate a moderating effect. This study highlights the need for targeted interventions such as financial education, personalised advice, and social influence to improve consumers' optimal decisions. It also emphasises the importance of information transparency, streamlined offerings, and collaborations among government, financial institutions, and insurers to improve accessibility and bridge the gap in coverage and financial preparedness.

Keywords: Optimal decisions, life insurance purchasing behaviour, theory of planned behaviour, mediating role of intention, moderating role of hyperbolic discounting.

Keputusan Optimum dalam Gelagat Pembelian Insurans Hayat di Malaysia

ABSTRAK

Di Malaysia, kadar penembusan insurans hayat masih rendah berbanding dengan negara-negara seperti Taiwan, Jepun, dan Thailand, menunjukkan kekurangan dalam perlindungan dan kesiapsiagaan kewangan. Kajian ini bertujuan untuk meneliti keputusan penyederhana diskaun hiperbolik dan menyiasat pengaruh sikap, norma subjektif, persepsi kawalan tingkah laku, literasi kewangan, dan persepsi risiko terhadap keputusan optimum dalam gelagat pembelian insurans hayat melalui peranan pengantara niat. Teori tingkah laku yang dirancang dengan model diskaun hiperbolik telah digabungkan dalam kajian ini. Kajian ini menggunakan kaedah tinjauan dalam talian untuk mengumpulkan data daripada isi rumah di Malaysia melalui persampelan kemudahan dan bola salji. Tinjauan ini menghasilkan 304 respons dan telah dipilih untuk dianalisis melalui pemodelan persamaan struktur. Keputusan kajian menunjukkan bahawa norma subjektif, persepsi kawalan tingkah laku, literasi kewangan, dan persepsi risiko memberikan pengaruh terhadap keputusan optimum dalam gelagat pembelian insurans hayat. Niat memainkan peranan sebagai pengantara dalam hubungan antara sikap, persepsi kawalan tingkah laku, literasi kewangan, dan keputusan optimum dalam gelagat pembelian insurans hayat; namun, diskaun hiperbolik tidak menunjukkan kesan penyederhana. Kajian ini menekankan kepentingan pelaksanaan intervensi yang disasarkan seperti pendidikan kewangan, khidmat nasihat peribadi, serta pengaruh sosial dalam usaha mempertingkatkan keputusan optimum dalam gelagat pembelian insurans hayat dalam kalangan pengguna. Selain itu, kajian ini turut menunjukkan keperluan terhadap ketelusan maklumat, penyusunan semula produk yang lebih sistematik, dan kerjasama strategik antara kerajaan, institusi kewangan, dan syarikat insurans bagi memperluas aksesibiliti serta merapatkan jurang dalam perlindungan dan kesiapsiagaan kewangan.

Kata Kunci: Keputusan optimum, gelagat pembelian insurans hayat, teori tingkah laku yang dirancang, peranan pengantara niat, peranan penyederhana diskaun hiperbolik.

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LIST OF ABBREVIATIONS

TPB	Theory of Planned Behaviour
SAQ	Self-Administered Questionnaire
SEM	Structural Equation Modelling
TRA	Theory of Reasoned Action
PLS-SEM	Partial Least Squares-Structural Equation Modelling
INT	Intention to Make Optimal Decisions for Purchasing Life Insurance
ATT	Attitude towards Life Insurance
SN	Subjective Norm
PBC	Perceived Behavioural Control
FL	Financial Literacy
PR	Perceived Risk
HD	Hyperbolic Discounting
OD	Optimal Decisions of Life Insurance Purchasing Behaviour
CMV	Common Method Variance
VIFs	Variance Inflation Factors
OLS	Ordinary Least Squares Regression
CR	Composite Reliability
AVE	Average Variance Extracted
HTMT	Heterotrait-Monotrait Ratio
Q^2	Predictive Relevance

CHAPTER 1:

INTRODUCTION

1.1 Introduction

Insurance is a collaborative mechanism in modern society that alleviates financial losses arising from unforeseen events and risks by distributing these losses among individuals who choose to protect themselves through shared contributions (Nayak, 2019; Ramasamy, 2025). This pooling of resources can be achieved through the voluntary payment of premiums to insurance companies, which in turn agree to provide financial protection against the specified risks outlined in the insurance policy. Through purchasing insurance, individuals gain a sense of security and reassurance, knowing that they are not solely responsible for bearing the full brunt of the potential risks they face, thus promoting greater resilience and stability within the community.

In Malaysia, life insurance is recognised as a crucial wealth management tool, providing individuals and families with financial security and future assurance. The insurance market in Malaysia comprises approximately 55 licensed insurance companies and takaful operators, supported by a workforce of about 81,655 agents of 2023 (Life Insurance Association of Malaysia, 2023). However, the penetration rate of life insurance remains relatively low; GlobalData (2024), a management consulting company, reported that the penetration rate of life insurance in Malaysia was 3.3% in 2023, significantly trailing other markets in Asia such as Thailand (3.5%), Japan (6.3%), and Taiwan (9.3%). This low penetration rate highlights the need for innovative strategies by insurers to attract and retain customers.

Life Insurance Association of Malaysia (2024) also revealed that 58.6 percent of Malaysians covered under both conventional and Islamic life insurance, leaving over 40 percent of Malaysians uninsured in 2023. This indicates that a significant portion of the population may fail to recognise the importance of life insurance or may face barriers such

as affordability, lack of awareness, or cognitive biases, which hinder optimal decision-making. Consequently, many individuals and families remain financially vulnerable to unexpected events, highlighting the need for targeted interventions to improve life insurance adoption.

There are two main types of life insurance available in Malaysia, which are conventional life insurance and Islamic life insurance (family takaful). Conventional life insurance functions on the concept of risk transfer, where policyholders contribute premiums to an insurer who assumes the risk of financial loss and offers protection in the event of death, disability, or other specified occurrences (Saputra et al., 2020). Conventional life insurance is commonly used, but it may not align with the preferences of individuals seeking financial products that comply with ethical or religious principles. In contrast, family takaful is an Islamic alternative to conventional life insurance, based on mutual cooperation and shared responsibility (Rizwan & Al-Malkawi, 2024). In a family takaful arrangement, policyholders contribute to a common pool to provide financial assistance to members in need, particularly in the cases of life-related risks such as disability, critical illness, or death. Family takaful avoids elements like interest (riba) and uncertainty (gharar), aligning with Islamic teachings and offering a Shariah-compliant option for consumers seeking ethical or religious financial protection for themselves and their families.

One of the examples of attracting and retaining customers is Prudential Assurance Malaysia Berhad's PRUFirst policy offers comprehensive coverage, including life coverage, total permanent disability, personal accidents, premium waiver, and hospitalisation, together with rewards like RM100 Decathlon e-vouchers. Besides, the government's i-Lindung program, launched in July 2022, enables Employees Provident Fund contributors to buy reasonable life insurance and critical illness policies. Additionally, the i-MULA 50 Starter Pack Insurance Fund (SPIF), introduced in August 2024 by the Life Insurance Association of Malaysia, aims to provide affordable life insurance options for 100,000 eligible Malaysians through a RM5 million fund (Gilbert, 2024).

Despite the initiatives of life insurance, many consumers still make suboptimal decisions or low-quality optimal decisions regarding life insurance. These include misunderstandings of policy terms, selecting inappropriate policies, purchasing insufficient coverage, or relying solely on employer-provided insurance (Sum & Nordin, 2018). Such

decisions can lead to financial hardships, unanticipated expenses, and risks to dependents' standards of living.

Suboptimal or low-quality optimal decisions can be explained through the lens of behavioural economics, such as hyperbolic discounting. Traditional economic theories assume that people make rational and optimal decisions by gathering and processing information to maximise utility (Viljoen et al., 2021; Tsoukis et al., 2025). In the context of insurance, this traditional perspective suggests that consumers have perfect knowledge and should logically assess their insurance needs by evaluating potential risks, comparing policy options, and making optimal and informed decisions to secure adequate coverage (Kamoune & Ibenrissoul, 2022; Xia & Madni, 2024). However, behavioural economics challenges this assumption by recognising the significant impact of cognitive limitations, emotional influences, and psychological biases on decision-making. Biases like loss aversion, overconfidence, and present bias often result in systematic errors and suboptimal decisions. Additionally, cognitive constraints like bounded rationality make it difficult for individuals to process complex information, leading to decision paralysis or delays (Gao & Zhao, 2020; Wei et al., 2021).

Behavioural economics acknowledges that investment markets are not always efficient due to individuals' susceptibility to cognitive biases and emotional influences (Suresh, 2024). In the life insurance context, behavioural economics, such as hyperbolic discounting, plays a crucial role in explaining deviations from rational decision-making. These biases help explain why consumers may underinsure, delay purchasing policies, or select suboptimal coverage. By integrating insights from behavioural economics into the study of optimal decision-making, policymakers and insurance companies can gain a deeper understanding of how cognitive biases shape life insurance purchasing behaviour, ultimately enabling the development of more effective interventions and policies.

1.2 Background of Study

Life is loaded with risks and uncertainties, exposing individuals to the perpetual threat of misfortune and suffering. Individuals, regardless of whether they are the primary financial supporters, seek to protect or maintain their family's lifestyle in the face of unforeseen events, driven by concern for their future well-being. Thus, the insurance

industry is established to ensure families' financial security when individuals are not able to perform daily activities (Banks & Bowman, 2017; Spoz, 2024). Insurance is essential for protecting individuals, their families, properties, and assets, as well as for providing financial security in the event of medical emergencies, hospitalisation, natural disasters, disabilities, or future medical care needs.

Insurance falls into two main categories: general (non-life) and life insurance. General insurance, also known as non-life insurance, does not provide life coverage for the insured but covers losses caused by the insured within the policy period whereas life insurance is a contract between an individual and an insurance company that ensures a specified sum for named beneficiaries upon the insured's death. Although insurance is broadly categorised into general (non-life) and life insurance, this study focuses specifically on life insurance, which dominates the insurance industry, with 58.6 percent of Malaysians covered under both conventional and Islamic life insurance in 2023 (Life Insurance Association of Malaysia, 2024).

Multiple types of life insurance include endowment, investment-linked insurance, life annuity, mortgage-reducing term assurance (MRTA), supplementary rider, term insurance, and whole life insurance as shown in Table 1-1 (Intelligent Money Sdn Bhd, 2023).

Table 1-1:
Types of Life Insurance

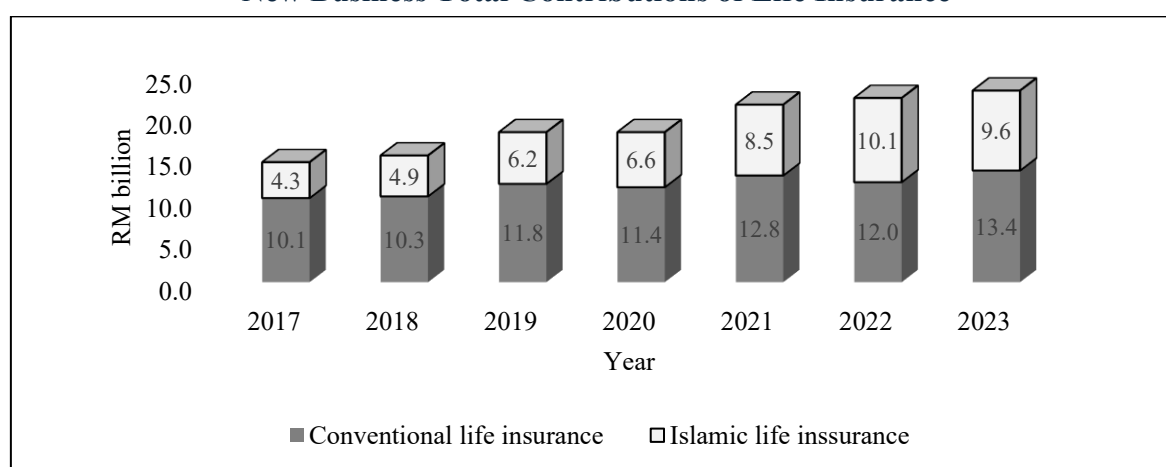
Types of Life Insurance	Descriptions
Endowment	- Pay a fixed term with annual accumulated profits after a specific term ('maturity') or upon death. - Typically, priced higher than term plans due to maturity benefits.
Investment-Linked Insurance	- Merges investment with protection, allowing consumers to allocate premiums to life insurance and chosen funds. - Offers flexibility for contributions and withdrawals, promising higher potential returns than an endowment plan.
Life Annuity	- Offers a regular retirement income (monthly, quarterly, or yearly) throughout their lifetime. - The annuity terminates upon death.
Mortgage-Reducing Term Assurance	- Repays property loans to financial institutions in case of premature death, critical illness, or total permanent disability.
Supplementary Rider	- Known as additional benefits attached to a life insurance policy, often requiring an extra premium payment. - Common riders include personal accidents, critical illnesses, and medical coverage.

Term Insurance	- Guarantees a death benefit if the insured passes away within a specific term, often cheaper than other life insurance types.
Whole Life Insurance	- Also known as traditional life insurance, it is a cash-value policy providing permanent death benefit coverage for the insured's life.

Source: Intelligent Money Sdn Bhd (2023)

Figure 1-1 compares total contributions of new business between Islamic life insurance and conventional life insurance in Malaysia from 2017 to 2023, highlighting the steady growth in contributions for both life insurances over the years.

Figure 1-1:
New Business Total Contributions of Life Insurance



Source: Hazim, 2023; Siddharta, 2024

Based on Figure 1-1, conventional life insurance consistently records higher contributions than Islamic life insurance throughout the period, starting at RM10.1 billion in 2017 and peaking at RM13.4 billion in 2023. In comparison, Islamic life insurance shows significant growth, starting at RM4.3 billion in 2017 and nearly doubling to RM10.1 billion in 2022 before slightly declining to RM9.6 billion in 2023. Despite this rapid growth, conventional life insurance remains the larger segment, maintaining its dominance in the Malaysian market. Additionally, the total contributions for both conventional and Islamic life insurance grew steadily from RM14.4 billion in 2017 to RM23.0 billion in 2023, reflecting the overall expansion of the life insurance sector.

Table 1-2:
Top Five Malaysia Conventional Life Insurance Market Leaders

Rankings	Conventional Life Insurance Companies
1	Allianz Life Insurance Malaysia Berhad
2	AmMetLife Insurance Berhad
3	AXA Affin Life Insurance Berhad
4	Etika Life Insurance Berhad
5	Sun Life Malaysia Assurance Berhad

Source: Mordor Intelligence Private Limited (2025)

Table 1-3:
Top Five Malaysia Islamic Life Insurance Market Leaders

Rankings	Islamic Life Insurance Companies
1	Prudential BSN Takaful Berhad
2	Etika Family Takaful Berhad
3	Syarikat Takaful Malaysia Keluarga Berhad
4	AIA Public Takaful Berhad
5	Great Eastern Takaful Berhad

Source: Malaysian Reinsurance Berhad (2022)

Table 1-2 shows Malaysia's leading conventional life insurance companies, with Allianz Life Insurance Malaysia Berhad topping the ranks. Mordor Intelligence Private Limited (2025) placed AmMetLife Insurance Berhad and AXA Affin Life Insurance Berhad in second and third positions. Table 1-3 presents the top five Islamic life insurance companies, with Prudential BSN Takaful Berhad securing the top position according to Malaysian Reinsurance Berhad (2022).

The substantial growth of life insurance in Malaysia as shown in Figure 1-1, highlights a rising awareness of financial security. However, the process of making optimal decisions regarding life insurance can be significantly shaped by several behavioural factors. Behavioural economics is responsible for understanding decision-making processes, particularly by examining how cognitive biases, such as hyperbolic discounting affect individuals' choices, including life insurance decisions (Nabeshima et al., 2025). By investigating biases, heuristics, and information processing mechanisms, behavioural economics provides insights into why individuals may undervalue or overvalue certain risks, which can lead to suboptimal decisions in purchasing life insurance. Those suboptimal decisions may result in inadequate coverage, regret, or increased costs (Sarwar et al., 2022;

Gunasena et al., 2025). Understanding these behavioural factors empowers consumers to make the best decisions which are aligned with their long-term financial goals.

Behavioural economics assumes that deviations from rational behaviour are due to cognitive biases, such as non-standard preferences, bounded self-control, and imperfect optimisation, which can lead to less optimal decisions (Bragg Jr, 2020; Alm et al., 2023). Non-standard preferences highlight the fact that individuals' preferences are shaped not only by their beliefs, values, and social norms but also influenced by the present biases. The consumers' non-standard preferences also change over time and are influenced by personal circumstances such as income level, health status, and employment status. Bounded self-control refers to the difficulty in translating intentions into decisions, especially when making optimal decisions for purchasing life insurance. Imperfect optimisation occurs when consumers fail to consider critical factors, such as policy terms, coverage needs, or the affordability of premiums during the life insurance purchasing process, leading to less optimal decisions.

1.3 Problem Statement

Malaysians tend to live longer and receive high-quality, modern medical services, with a life expectancy of 75.2 years for newborns in 2024 (Department of Statistics Malaysia, 2025). The extended lifespan brings forth potential risks and uncertainties, making financial support crucial for medical costs associated with critical illnesses, permanent disabilities, or accidents due to medical inflation. In the worst-case scenario, the insufficient coverage might lead to financial challenges or sudden death. Life insurance not only provides a safety guarantee for unforeseen circumstances but also offers a stable income during retirement, enhancing individuals' ability to enjoy their daily lives. Additionally, inflation can also significantly influence life insurance policies, affecting both the affordability and effectiveness of coverage, which may lead to low-quality optimal decisions. It can erode the real value of payouts and increase premiums, causing individuals to underestimate future needs or forgo adequate coverage, ultimately misaligning decisions with long-term financial goals (Shin et al., 2024).

GlobalData (2024) reported that the life insurance penetration rate in Malaysia is still low compared to other nations like Taiwan, Japan, and Thailand, representing that a

significant portion of the population does not have sufficient coverage. In 2023, the combined penetration rate of conventional and Islamic life insurance was 58.6 percent, leaving over 40 percent of Malaysians uninsured. It indicates that a significant portion of the population may fail to recognise the importance of life insurance or may face barriers such as affordability, lack of awareness, or cognitive biases, which hinder optimal decision-making. Consequently, many individuals and families remain financially vulnerable to unexpected events, highlighting the need for targeted interventions to improve life insurance adoption.

According to the positive economics perspective, individuals are assumed to be rational consumers with complete information, enabling them to effectively evaluate and compare insurance options to maximise their utility (Dhongde & Pattanaik, 2009; Drakopoulos, 2024). However, optimal decision-making regarding life insurance remains a significant challenge in Malaysia. According to Life Insurance Association of Malaysia (2022), which revealed that policyholders prefer to purchase multiple policies, indicating suboptimal decisions due to duplication of coverage, lack of financial planning, and cognitive biases. Krishnan (2020) also reported that 90% of Malaysians did not have sufficient coverage for themselves and their families but were unaware of the fact. Additionally, Subramaniam and Gomes (2019) stated a deficiency in optimal decision-making among Malaysian consumers, revealing a low level of acceptance and awareness of insurance as a crucial component of their wealth planning.

Suboptimal decisions in life insurance purchases can be explained through behavioural perspectives, highlighting how cognitive biases, emotional influences, and social factors shape individuals' choices (Lejarza et al., 2022). These biases often result in less optimal decisions that are not aligned with long-term financial goals, leaving consumers with inadequate coverage or, in some cases, no coverage at all. For example, individuals may choose the wrong type of life insurance policy, such as opting for term life insurance instead of whole life insurance, which may not meet their long-term financial needs. Such decisions can result in dissatisfaction and insufficient protection. These suboptimal decisions can cause significant personal financial burdens, including excessive debt, poor financial planning, or inadequate savings, which lead to financial stress, difficulty meeting basic needs, limited access to healthcare, and a reduced ability to achieve long-term financial goals. Additionally, individuals who fail to pay premiums or maintain the policy adequately may

lead to policy lapses, resulting in loss of coverage and potential financial loss for the insured's beneficiaries.

Several variables can influence the quality of the optimal decisions of life insurance purchasing behaviour. An individual's attitude towards life insurance is essential in shaping consumers' optimal decisions, as it significantly affects their perceptions, preferences, and choices on life insurance (Simpson et al., 2012; Nwosu & Ilori, 2024). Krishnan (2020) also discovered that some Malaysians consider insurance more as a financial burden rather than a necessity. This negative attitude contributes to the reluctance to invest in life insurance coverage. Loanstreet (2019), a Malaysian personal finance-focused website, also revealed that 27% of participants who did not purchase life insurance believed that their families could survive more than 12 months without their salaries, reflecting a certain attitude towards life insurance. This suggests a perception that life insurance may not be deemed essential because of the confidence in the family's ability to manage financially without life insurance for an extended period.

Besides, the subjective norm also influences suboptimal decisions of life insurance purchasing behaviour. Krishnan (2020) found that only 4 percent of lower-income households purchased life insurance or takaful coverage. The individuals from lower-income households, influenced by the norms and expectations of their social environment, tend to view insurance more as a financial burden than an essential protective measure. Once their close contacts do not believe life insurance as significant, it can deter individuals from purchasing it, leading to suboptimal decisions. Additionally, Sun Life Malaysia (2025) revealed that 29 percent of Generation Z respondents did not seek professional help when making financial decisions, indicating a tendency to rely on peer advice or self-guided choices, which may lead to suboptimal decisions.

Furthermore, perceived behavioural control becomes one of the critical factors when individuals encounter obstacles in making optimal decisions. The core issue arises when a diminished sense of control leaves individuals feeling overwhelmed or uncertain about navigating the complexities of available insurance options. This uncertainty serves as a breeding ground for suboptimal decision-making, leading to behaviours such as delaying the purchase of life insurance or choosing options that diverge from their primary long-term financial goals. The correlation between perceived behavioural control and decision quality

highlights the significance of addressing perceived control as a foundational element in influencing individuals' choices within the life insurance domain.

In addition, Malaysians' financial literacy regarding life insurance is quite low and might limit their ability to make optimal decisions for purchasing life insurance. Goh (2022) discovered that approximately one-third of Malaysians exhibit limited financial literacy, with up to 92% of this group opting for deposit products and displaying a lower likelihood of incorporating high-risk investment products into their portfolio. Many Malaysians have a limited understanding of key financial concepts, making it challenging to assess the benefits and risks of different life insurance options and select a plan that aligns with their needs and budget. Lin et al. (2019) highlighted the complexity of decision-making for life insurance and family takaful products compared to other financial instruments. The Central Bank of Malaysia's (2022) findings also indicated that 53% of respondents perceive an annual return between 20% and 30% as low to medium, revealing a misunderstanding of risks. This limited financial literacy leads Malaysians to delay life insurance purchases and neglect financial planning, resulting in less optimal decisions. Alarming, over a third of participants in Malaysia exhibit low digital financial literacy, sharing personal information or passwords with friends, reflecting a lack of understanding and awareness of digital security measures and financial risks.

Moreover, the consumers' perceived risk towards life insurance can be viewed through the lens of uncertainties related to policy terms and conditions (Goh, 2022). Individuals may be hesitant to invest in life insurance due to the lack of information transparency or knowledge regarding the details of insurance policies, terms, and potential hidden costs. They might exhibit risk aversion, leading to suboptimal decisions. Enhancing transparency, simplifying policy information, and providing comprehensive education on insurance products could help alleviate these perceived risks and encourage more informed and optimal decision-making among consumers.

This study applies the theory of planned behaviour (TPB) to better understand the optimal decisions of life insurance purchasing behaviour. TPB treats intention as the immediate determinant of the final optimal decision regarding a specific behaviour, which is influenced by attitude, subjective norm, and perceived behavioural control, thus the behavioural intention acts as a mediator between independent variables and final optimal decisions.

However, TPB did not explain why people did not behave according to their intentions, which is known as intention-behaviour discrepancy (Van Hooft et al., 2005; Ferreira et al., 2023). Although the tendency of consumers to express strong intentions to purchase specific products has increased, little empirical evidence has suggested that these intentions are consistently converted into actual purchases (Joshi & Rahman, 2015). Hassan et al. (2016) revealed that intentions may change over time; thus, intentions measured at one point regarding a distal behaviour often yield a weak association with subsequent behaviour. Similarly, Zaikauskaite et al. (2023) also discovered that intention is frequently overestimated, yielding inflated responses that may be shaped by social desirability rather than genuine behavioural commitment. Thus, behavioural economics is applied to the TPB framework in this study to explain the discrepancy between behavioural intention and the final optimal decisions, highlighting how real-world decision-making is often influenced by bounded rationality and intertemporal trade-offs rather than purely rational intentions.

Behavioural economics addresses hyperbolic discounting as a psychological explanation for why consumers intend to make optimal decisions but subsequently fail to follow through (Baddeley, 2018; Umapathy, 2024). The irrational and less optimal decision regarding a specific behaviour due to present bias, is manifested in an intention-behaviour discrepancy. Additionally, consumers with a stronger present-bias may be more inclined to make suboptimal decisions regarding life insurance, leading to higher costs in the form of increased premiums, additional fees, or limited coverage when they need it urgently. According to Behavioural Insights Team (2021), who conducted an online survey with a total of over 2,000 Malaysians, revealing that people with higher present-biased were less likely to participate in long-term financial decisions, such as saving and insuring. Perbadanan Insurans Deposit Malaysia (2025) revealed that 55 percent of respondents had less than RM10,000 in emergency savings, indicating that those with higher present bias are less likely to save for an emergency, especially among the low-income group.

The field of optimal consumer decisions has been discussed over the past decade (Taghdisi et al., 2018; Pal et al., 2023; Haji et al., 2024). Prior research has largely concentrated on attitude, subjective norm, and perceived behavioural control as the principal determinants of intention and actual behaviour within the framework of TPB (Ajzen, 1985; Fan et al., 2021). However, insufficient attention has been given to incorporating financial literacy and perceived risk, creating a notable gap that this study addresses by extending

TPB to better explain optimal decisions of life insurance purchasing behaviour. Thus, this study seeks to address the fundamental research question: “What are the optimal decisions of life insurance purchasing behaviour?”

Besides, less research on the mediating role of behavioural intention is conducted (Ifedayo et al., 2021; Mamun et al., 2021), thus this study introduces the intention to make optimal decisions for purchasing life insurance as a mediator to bridge the gap between the independent variables and optimal decisions of life insurance purchase behaviour. Lastly, there is inadequate literature to explain how hyperbolic discounting act as a moderator (Adnan et al., 2017). Therefore, hyperbolic discounting is employed as a moderator to bridge the gap between intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour.

1.4 Research Questions

This study has three research questions, which are:

1. How do attitude, subjective norm, perceived behavioural control, financial literacy, and perceived risk affect the optimal decisions of life insurance purchasing behaviour?
2. How does the intention mediate the relationship between attitude, subjective norm, perceived behavioural control, financial literacy, perceived risk, and optimal decisions of life insurance purchasing behaviour?
3. How does hyperbolic discounting moderate the relationship between the intention to make the optimal decisions for purchasing life insurance and the optimal decisions of life insurance purchasing behaviour?

1.5 Research Objectives

1.5.1 General Objective

To investigate the moderating effect of hyperbolic discounting towards the optimal decisions of life insurance purchasing behaviour and examine the influences of attitude, subjective norm, perceived behavioural control, financial literacy, and perceived risk on the optimal

decisions of life insurance purchasing behaviour through the mediating role of intention to make the optimal decisions for purchasing life insurance.

1.5.2 Specific Objectives

The specific objectives of this study are:

1. To investigate the effects of attitude, subjective norm, perceived behavioural control, financial literacy, and perceived risk on the optimal decisions of life insurance purchasing behaviour.
2. To assess the mediating effect of intention to make the optimal decisions for purchasing life insurance on the relationship between attitude, subjective norm, perceived behavioural control, financial literacy, perceived risk and optimal decisions of life insurance purchasing behaviour.
3. To examine the moderating effect of hyperbolic discounting on the relationship between the intention to make the optimal decisions for purchasing life insurance and the optimal decisions of life insurance purchasing behaviour.

1.6 Scope of Study

The scope of the study is to investigate the moderating effect of hyperbolic discounting towards the optimal decisions of life insurance purchasing behaviour and examine the influences of attitude, subjective norm, perceived behavioural control, financial literacy, and perceived risk on the optimal decisions of life insurance purchasing behaviour through the mediating role of intention to make the optimal decisions for purchasing life insurance. This study focuses on individuals aged 18 years or above who have purchased life insurance with financial stability. According to the Attorney General's Chambers of Malaysia (2006), a person is legally recognised as an adult at the age of 18 years old, as stated under the Age of Majority Act 1971 (Act 21). This age threshold indicates that the individuals have full legal capacity to enter into contracts or exercise other civic rights. Financial stability is defined as the ability to meet basic living expenses through personal income or other financial resources, without relying on unsustainable debt or external financial assistance (Sabri et al., 2023; Katnic et al., 2024). The households mean family

members who share a living space and household resources such as food, utilities, and living expenses (Department of Statistics Malaysia, 2023; Godbole et al., 2025).

1.7 Significance of Study

The results of the study can make significant contributions to the body of knowledge. Although the theory of planned behaviour (TPB) has been extensively employed to explain consumer decision-making, it remains limited in capturing critical determinants of financial behaviour, particularly financial literacy, perceived risk, and behavioural biases such as hyperbolic discounting. By integrating these constructs, this study advances the explanatory capacity of TPB and provides a more comprehensive model for analysing optimal decision-making in the context of life insurance. Such an enhancement is essential not only for addressing the unique challenges identified among Malaysian consumers but also for contributing to the refinement of behavioural theories that can be applied across diverse financial and consumer domains.

Insurance companies should prioritise educating potential customers about the benefits and significance of life insurance in order to develop more favourable attitudes toward its adoption. This is particularly important in Malaysia, where life insurance penetration remains comparatively low, with a significant share of the population uninsured or underinsured due to limited awareness and persistent misconceptions. Educational initiatives, including campaigns organised in collaboration with community leaders and influencers, can play an essential role in enabling consumers to overcome these barriers and make more informed and optimal decisions. Enhancing awareness is therefore of critical importance, as it not only strengthens individual financial planning and risk management but also addresses systemic inefficiencies in coverage that contribute to the financial vulnerability of households.

Understanding subjective norms allows insurance companies to guide customers toward optimal decisions regarding life insurance, as individuals are often influenced by the expectations of family, peers, and their wider social groups. Recognising these influences allows insurance providers to identify customer segments where social pressure is strong and favourable, such as family-oriented individuals, collectivist communities, or groups with higher financial literacy. By aligning their marketing strategies (family-based discount plans,

referral programs) with the values and expectations of these social circles, insurance providers can foster greater trust, encourage responsible decision-making, and increase the likelihood of customers making well-informed and optimal decisions regarding life insurance. This is particularly relevant in Malaysia, where the issue has highlighted that many purchasing decisions are shaped by social influence rather than careful planning, often resulting in duplication of coverage or inadequate protection.

Moreover, the findings of this study provide valuable implications for the Malaysian government and insurance policymakers by offering empirical evidence that can inform strategies to mitigate limited financial literacy, low consumer awareness, and the prevalent tendency to postpone life insurance purchases. The study contributes to the design of financial education programs, regulatory reforms, and consumer protection measures that are essential for strengthening individuals' knowledge and decision-making capacity. In this regard, the study emphasises the importance of early action, highlights the risks associated with delaying, and advances the promotion of more informed and optimal decisions regarding life insurance purchasing behaviour, thereby contributing to both consumer welfare and the long-term sustainability of the insurance sector.

Many individuals refrain from taking timely action due to uncertainty about product benefits, policy complexity, and potential financial losses. By providing clear and transparent information, this study helps insurers and policymakers to enhance communication strategies, improve transparency, and foster consumer trust. Ultimately, these efforts can reduce perceived risk and encourage individuals to make more timely and optimal decisions regarding life insurance.

Besides, this study highlights the importance of perceived behavioural control in shaping optimal decisions of life insurance purchasing behaviour. The findings assist insurance companies and policymakers in designing initiatives that strengthen individuals' sense of control, such as simplifying policy structures, offering flexible payment options, and providing decision-support tools, for example, online calculators or mobile applications that help consumers estimate coverage needs and compare policy options.

Individuals often acknowledge the importance of insurance yet postpone action because the immediate cost of premiums outweighs the perceived distant benefits of protection. By empirically examining this tendency, the study helps policymakers and

insurers provide evidence-based guidance to design strategies such as premium incentives, early-purchase rewards, or policy framing that emphasises immediate security rather than deferred gains. The findings of this study can be employed as academic information for future academics who are concerned in such a similar field of study. The outcomes of this study can be taken as baseline data to conduct further investigation.

1.8 Organisation of Study

This study is divided into five chapters, which are Introduction, Literature Review, Methodology, Results and Discussions, and Conclusion. The contents of the research background, problem statement, research questions, research objectives, the scope of the study, significance of the study, and lastly organisation of the study build the basic structure in Chapter 1.

Secondly, Chapter 2 delivers a literature review of the study. The first section describes the theoretical studies involving the theory of planned behaviour (TPB) and the hyperbolic discounting model. The following part discusses hypothesis development related to the optimal decisions of life insurance purchasing behaviour, followed by a concluding remark.

Thirdly, Chapter 3 covers the methodology of this study. Chapter 3 focuses on the research paradigm, research design, and research setting. This chapter is also concerned with sampling design, followed by survey design and data collection. Then, structural equation modelling (SEM) is included in this study to assess the reliability and validity of the construct and hypothesis testing for the causal relationship among the variables with the use of SmartPLS 4. Both mediating and moderating analyses are also performed in this study. Ethical considerations are also discussed in Chapter 3.

Fourthly, research findings are covered in Chapter 4. This chapter involves data preparation, assumption testing, descriptive statistics, both measurement and structural models through SmartPLS, mediation analysis and moderation analysis. Chapter 4 also discusses the findings that address the research objectives.

Lastly, Chapter 5 summarises the results of this study. Chapter 5 also explores the study's limitations, recommendations for future research, and implications.

CHAPTER 2:

LITERATURE REVIEWS

2.1 Introduction

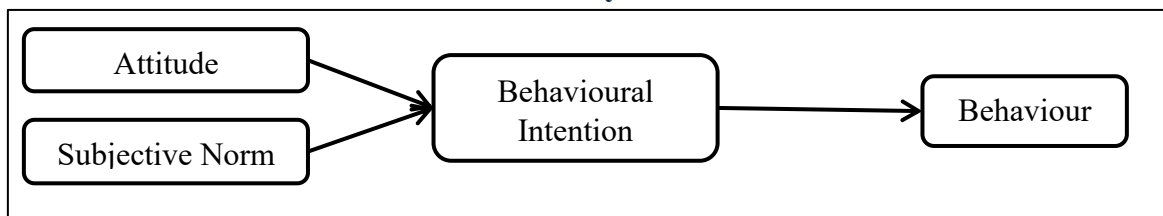
This chapter outlines the previous literature that forms the theoretical model of this study. Chapter 2 starts with an analysis of relevant theories or models applied in this study, followed by a detailed explanation of optimal decisions of life insurance purchasing behaviour. This chapter also explores the research framework and hypothesis development, including the relationships between the key variables. This chapter concludes with a remark.

2.2 Theoretical Studies

This chapter covers the theoretical background of the study. A theory is a set of interconnected constructs expressed through assumptions or propositions that illustrate the relationships between variables (Nkhata et al., 2019). This study aims to investigate the determinants of optimal decisions of life insurance purchasing behaviour based on the theory of planned behaviour (TPB) and the hyperbolic discounting model.

2.2.1 Theory of Reasoned Action (TRA)

Figure 2-1:
Path Models for Theory of Reasoned Action



Source: Fishbein and Ajzen, 1975.

The theory of reasoned action (TRA) adopted by Fishbein and Ajzen (1975), as shown in Figure 2-1, is one of the social behaviours that is widely used for the prediction of

behavioural intention or actual behaviour. TRA has been applied in the marketing and social psychology literature to explain why people perform certain behaviours such as drinking (Schlegel et al., 1992; Gastil, 2000; Hayden, 2022), smoking (Marin et al., 1990; Guo et al., 2007; Dono et al., 2020), or purchase behaviour (Belleau et al., 2007; Hussain et al., 2016; Jawed et al., 2025). TRA assumes that the behaviour under observation is under volitional control, which implies that the individuals believe that they can engage in a specific behaviour at any time if they are willing to do so. The basic assumption of TRA is that individuals are rational thinkers and make efficient use of the information accessible to them (Ajzen & Fishbein, 1980). People intend to behave in such ways to meet their positive expectations or outcomes.

However, the explanation of TRA excludes a wide range of behaviours such as habitual, impulsive, scripted, thoughtless, or spontaneous (Hale et al., 2002; Hoewe & Sherrick, 2015; Borusiak et al., 2024). Such behaviours are excluded from TRA because the decision makers might not be in a conscious condition or their behaviour might not be voluntary in making optimal decisions. TRA also excludes those behaviours that require unique resources or opportunities, special skills, or collaboration with others to be performed (Conner & Sparks, 2005). TRA also excludes the function of emotions in developing behaviour. Emotions have a significant impact on behaviour and ignoring them can result in an incomplete understanding of why people perform in certain ways.

There are three major constructs to predict behaviour in TRA, namely behavioural intention, attitude, and subjective norm. According to TRA, the immediate or most proximal predictor of volitional behaviour is an individual's behavioural intention regarding a specific behaviour. Behavioural intention is induced by the attitude towards executing volitional behaviour and subjective norms. The stronger the positive attitude towards actual behaviour and the stronger the subjective norm perceived by the consumers, the higher the probability they intend to perform actual behaviour. Attitude and subjective norms affect actual behaviour indirectly through the behavioural intention to engage in a specific behaviour.

Attitude in TRA theory is defined as beliefs towards the effects of performing the actual behaviour as well as one's positive or negative evaluation of the effects (Ajzen & Fishbein, 1980). Attitude towards actual behaviour is composed of two components, which are behavioural beliefs and evaluation of outcomes. Behavioural beliefs are defined as one's perceived beliefs about the expected outcomes of performing certain behaviours. Evaluation

of outcomes refers to whether the perception of an individual on the behavioural outcomes is positive or negative. In simple words, if a person has a favourable attitude towards a certain behaviour, he or she believes that performing the behaviour will lead to mainly positive outcomes or vice versa.

Subjective norms, which are one of the components of TRA, are defined as one's perception from the social pressure that influences him or her to behave in a particular behaviour (Ajzen & Fishbein, 1980). Subjective norm also refers to individuals' normative beliefs about social expectations of significant people such as parents, spouses, or close friends and their motivation to comply with those significant people. Normative belief is defined as human beings' belief that is understood by significant people or groups that influence them whether performing or not performing behaviour (Fang et al., 2017). Motivation to comply is a general tendency of a person to accept what a given referents think a person should do (Fishbein & Ajzen, 1975).

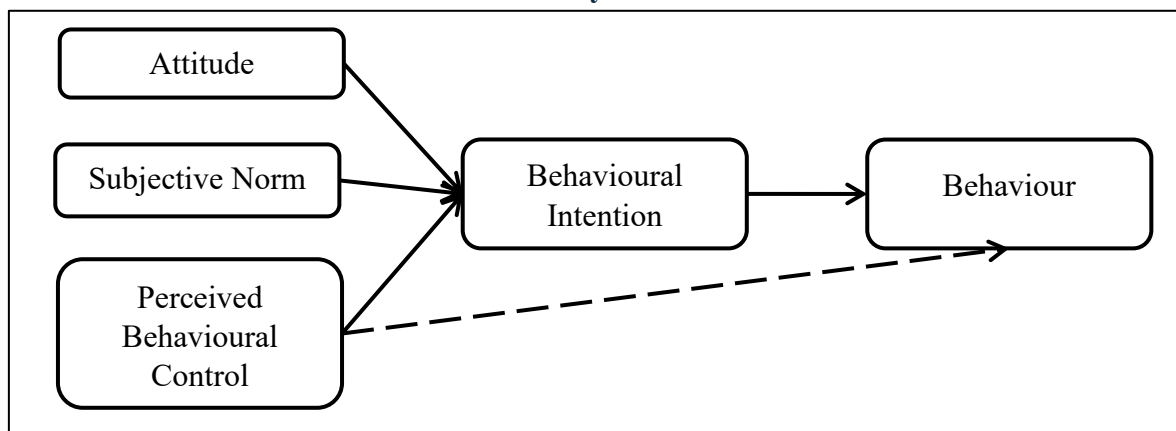
Based on TRA, behavioural intention acts as a mediating role between attitude, subjective norm, and actual behaviour (Cai & Shannon, 2012; Yu et al., 2021). According to the TRA, a consumer's actual behaviour is mostly determined by his or her behavioural intention, which is determined by one's attitude towards specific behaviour and subjective norms to perform or not perform that behaviour. The relationship between attitude, subjective norm, and actual behaviour is mediated by behavioural intention, stating that the attitude and subjective norms affect the strength of behavioural intention, which in turn affects actual behaviour.

Other than attitudes towards actual behaviour and subjective norms, TRA does not directly deal with other variables. Those variables, such as self-concept, demographic characteristics, or personality traits, are external variables that might influence behavioural intentions indirectly through their impact on the attitudinal and normative components and their relative weights. The behavioural economics also argued that TRA was unable to predict irrational behaviours or suboptimal decision-making, as TRA assumed that all voluntary and conscious behaviours performed by decision-makers are rational and efficient based solely on their attitude and subjective norms. However, people often make suboptimal decisions that deviate from rationality, affected by cognitive biases, emotional factors, or other situational influences. Previous research also showed that the behavioural intention does not result in actual behaviour when there is incomplete control over behaviour. Thus,

Ajzen (1985) developed the theory of planned behaviour (TPB) by adding a perceived behavioural control (PBC) component in TRA to explain those consumer behaviours that occur without volitional control. Coleman et al. (2011) also found that attitude has a more significant impact compared to subjective norms and perceived behavioural control in predicting favourable and unfavourable behavioural intentions.

2.2.2 Theory of Planned Behaviour (TPB)

**Figure 2-2:
Path Models for Theory of Planned Behaviour**



Source: Ajzen, 1985.

The theory of planned behaviour (TPB), as displayed in Figure 2-2, is a psychological theory that establishes the relationship between people's beliefs and actions. Ajzen (1985) first proposed TPB in his chapter titled “From Intentions to Actions: A Theory of Planned Behaviour” and represented an evolution and expansion of TRA, which was initially introduced by Ajzen and Fishbein. TPB delineates the factors influencing a person's best decision to adopt a specific behaviour.

According to TPB, human decisions are guided by three types of beliefs: behavioural beliefs, which shape attitudes toward the decision; normative beliefs, which create perceived social pressure or subjective norm; and control beliefs, which create perceived ease or difficulty to perform the specific decision. These beliefs shape behavioural intention, which serves as the motivational factor driving individuals to engage in a specific decision (Ajzen, 1985; Conner, 2020). In the context of life insurance purchasing behaviour, the individuals’ attitude, social influences, and perceived control can shape their intention to make optimal decisions that align with their financial needs and future security.

Perceived behavioural control refers to an individual's expectation of their ability to execute a behaviour, aligning with Bandura's (1982) concept of self-efficacy, which emphasises confidence in one's ability to make effective and optimal decisions (Ajzen, 2002; Liddelow et al., 2023). While self-efficacy and perceived behavioural control are conceptually similar, perceived behavioural control also accounts for external constraints that may hinder decision-making (Ajzen, 2002). For instance, a consumer may have a strong intention to buy life insurance, but financial constraints, complex policy terms, or lack of trust in insurance providers could prevent them from making a confident and optimal decision. However, higher perceived behavioural control enables individuals to navigate policy options, assess risks, and make well-informed choices, ultimately leading to optimal decisions.

Since uncontrollable factors can disrupt an individual's ability to act on their intentions, perceived behavioural control plays a crucial role in predicting actual behaviour. This highlights a key limitation of TRA, which does not account for perceived behavioural control, making TPB a more comprehensive framework for understanding decision-making. Given its ability to incorporate attitudinal, social, and control-related factors, TPB is applied in this study to examine the factors that influence optimal decision-making of life insurance purchasing behaviour, ensuring individuals make informed and beneficial financial decisions.

TPB is the main theoretical framework in this study because it provides a comprehensive approach to understanding human behaviour, particularly in complex decision-making processes (Ajzen, 1985; Norizan et al., 2025). Behavioural intention acts as a mediator between attitudes, subjective norms, perceived behavioural control, and actual optimal decisions, bridging the gap between individuals' beliefs and their final decisions in the context of life insurance purchasing behaviour (Alfiero et al., 2022). TPB also addresses the intention-behaviour gap that arises when individuals fail to translate their intentions into actual optimal decisions due to cognitive biases or external constraints. Thus, this study integrates TPB with behavioural economics concepts like hyperbolic discounting, as discussed in Section 2.2.3, to provide a deeper understanding of cognitive biases that influence optimal decision-making.

2.2.3 Hyperbolic Discounting Model

Behavioural economics, particularly the concept of hyperbolic discounting, challenges the assumptions of traditional economics by suggesting that individuals often rely on cognitive biases instead of making rational, utility-maximising decisions (Ostapiuk, 2024; Tsoukis et al., 2025). Optimal decision-making for future events is often hindered by immediate emotional or visceral preferences, causing individuals to make impulsive decisions that harm their long-term well-being, such as engaging in unhealthy habits like overeating or smoking. Hyperbolic discounting further explains this tendency, showing that people often disproportionately favour immediate rewards, even when these choices are detrimental in the long run.

Studies on intertemporal decisions have revealed that consumers are significantly present-biased (O'Donoghue & Rabin, 1999; Maji & Prasad, 2025). These intertemporal decisions are often linked to impulsivity (Jimura et al., 2013; Lv et al., 2019); individual differences in time orientation (Daugherty, 2011; Keidel et al., 2021); and differences in cognitive representations between near and future events (Cheke et al., 2011; Yamashiro et al., 2023). Hyperbolic discounting or present bias describes how individuals disproportionately devalue future rewards compared to immediate gratification, leading to preference reversals over time. As the time horizon lengthens, the rate at which the value of an outcome is discounted over time (delay discounting) declines. For example, Thaler (1981) found that individuals demanded \$30 instead of \$15 to wait for three months (a discount rate of 277%) but required \$60 only for a year (a discount rate of 139%), and \$100 for three years (a discount rate of 63%). This demonstrates how individuals prioritise immediate rewards over future ones.

Strotz (1973) also proposed that individuals tend to display greater impatience when making short-term decisions compared to long-term ones. This phenomenon, called preference reversal, is supported by experimental studies on time preference (Harris & Laibson, 2003; Toussaert, 2018). When rewards are distant in time, individuals may be patient, but when rewards are imminent, impatience increases. This reversal contrasts with the exponential discounting model, which assumes stable, time-consistent preferences over time (O'Donoghue & Rabin, 1999).

In the context of life insurance decisions, this preference reversal can explain why individuals often struggle to make optimal long-term decisions, as the immediate costs

(premium payments) tend to outweigh the delayed benefits (future payouts). The immediate costs and future benefits of life insurance often discourage the present-biased consumer from purchasing life insurance, leading to suboptimal decisions. People may also hesitate when considering long-term products like whole life insurance, as they realise their preferences and circumstances may alter over time and they do not want to commit to a long-term policy (Zhang et al., 2021).

Preference reversals in decision-making are common in everyday life. For instance, individuals often set long-term goals, such as exercising, dieting, or quitting smoking, but later struggle to stick to them. Immediate gratification tends to override long-term intentions, leading to procrastination and impulsivity. This tendency is explained by hyperbolic discounting, which helps clarify why people make irrational decisions despite initially desiring long-term benefits.

2.3 Optimal Decisions of Life Insurance Purchasing Behaviour

The concept of optimal decision-making has been examined through both neoclassical and behavioural economic viewpoints, each offering distinct explanations for how individuals make financial decisions. Neoclassical economics emphasises on rationality and utility maximisation whereas behavioural economics highlights the influence of cognitive biases, emotions, and heuristics that often lead to suboptimal outcomes. These contrasting perspectives provide a comprehensive foundation to understand optimal decision-making, especially in contexts where financial decisions are complex and influenced by both logical and psychological factors.

2.3.1 Neoclassical Perspectives

According to the perspective of neoclassical economics, optimal decisions are defined as the best choices from a set of alternatives that maximise individual utility or satisfaction within the given constraints of available financial resources or budget (Goodland & Ledec, 1987; Williams & Woodhouse, 2025). Utility is conceptualised as the individual's satisfaction derived from consuming goods and services (Yuan et al., 2022), and individuals are assumed to make decisions that enhance their overall utility. Neoclassical economics assumes that individuals are rational agents with perfect information who make decisions to maximise utility (Tsoukis et al., 2025). In the context of life insurance, consumers are

expected to assess various insurance policies based on coverage, cost, and risk, and select the one that offers the highest utility. This neoclassical perspective assumes that individuals possess accurate insurance knowledge of all relevant factors, including future risks and financial implications, allowing them to make informed and utility-maximising decisions towards life insurance.

Neoclassical economics often uses utility maximisation frameworks, which rely on the concept of marginal utility to determine optimal decision-making (Atanasovska et al., 2024). Marginal utility refers to the additional utility gained from consuming one additional unit of a product or service (Stauffer et al., 2014; Ahl et al., 2023). According to the principle of diminishing marginal utility, when consumers spend one more unit of a particular product or service, the additional utility they derive from each additional unit tends to decline. Thus, the goal of individuals' optimal decision-making is to allocate their scarce resources, such as time and money, to maximise their overall utility or satisfaction (Xiong et al., 2022). This can be achieved by equalising the marginal utility per unit of expenditure across different goods and services, ensuring that no further improvement in total utility is possible.

The optimal decisions of life insurance purchasing behaviour can also be explained through both Marshallian and Hicksian demand functions, as both approaches are grounded in the principle of utility maximisation. Marshallian demand, introduced by Alfred Marshall in his 1890 work, "Principles of Economics", refers to the quantity of a good that consumers choose to purchase at various prices while holding income and preferences constant, reflecting their attempt to maximise utility under a budget constraint (Marshall, 2013). In the context of life insurance, the Marshallian demand function explains that individuals maximise their utility by selecting the amount of life insurance that best satisfies their preferences, given their income and the prevailing premium rates. This approach incorporates both the income effect (changes in real purchasing power) and the substitution effect (shifts in consumption due to relative price changes).

Besides, Hicksian demand was founded by John Hicks in his seminal work, "Value and Capital" in 1939. The concept of Hicksian demand, also known as the compensated demand function, examines how individuals would adjust their life insurance purchases if their utility level were held constant while compensating for price changes, thereby isolating the substitution effect from income changes (Hicks, 1975). By applying these two demand

concepts, optimal decisions can be understood as the outcome of rational, utility-maximising behaviour under varying financial conditions and price scenarios.

Moreover, positive economics operates under the premise that individuals behave as rational agents who respond predictably to incentives and constraints, such as income, prices, and risk (Caplin & Schotter, 2011, Rodi & Miller, 2023). This approach is grounded in the rational actor model, which assumes that individuals make decisions by maximising expected utility based on consistent preferences and complete information. In the context of life insurance, this perspective suggests that individuals logically evaluate available options, such as coverage levels, premiums, and risk protection, aiming to select the policy that maximises their utility. By relying on assumptions such as rationality, consistency, and utility maximisation, positive economics provides a structured framework for analysing how consumers make insurance choices under various financial conditions and risk perceptions.

2.3.2 Behavioural Perspectives

Neoclassical economic theory assumed that individuals make optimal decisions based on rationality and utility maximisation (Atanasovska et al., 2024). Neoclassical economic theory assumed that individuals systematically evaluate alternatives and select the insurance option that maximises expected outcomes with given complete information and sufficient cognitive capacity. However, behavioural economics has challenged this assumption, arguing that real world decision-making is often influenced by cognitive biases, heuristics, social influences, and emotions, which often result in deviations from optimal decisions (Gomes, 2023). Cognitive biases are systematic deviations from rational judgment whereas heuristics are mental shortcuts or rules of thumb used to simplify complex decision-making processes, highlighting the constraints of bounded rationality (Frederiks et al., 2015; Ahmed & Rura, 2024). These behavioural tendencies suggested that individuals frequently make decisions under conditions of limited attention, imperfect information, and constrained cognitive resources, which can limit the predictive accuracy of traditional economic models (Nam & Yang, 2025).

Behavioural economics further argued that individuals often struggle to implement optimal decisions that serve their best interests, even when their decisions align with broader social goals (Schnellenbach, 2024). In the context of insurance, Baicker et al. (2012) also highlighted the role of consumer decision-making in determining insurance coverage and

policy uptake. Standard economic models often fail to capture actual financial behaviour, as consumers may struggle to make optimal decisions due to self-control deficits and cognitive biases. For instance, selecting a life insurance plan is a complex task, involving multiple product attributes, probabilistic outcomes, and temporal considerations, which can overwhelm cognitive capacity and result in suboptimal choices.

Among the cognitive biases, time-inconsistent preferences, especially present bias, emerge as a key barrier to optimal financial decision-making (Helleringer, 2018; Maji & Prasad, 2025). Individuals often exhibit present-biased preferences, overvaluing immediate costs and benefits while discounting future consequences, which leads to procrastination and inconsistent decision-making over time (Laibson & List, 2015; Maji & Prasad, 2025). In the context of life insurance, this tendency may manifest as delayed policy uptake, inadequate coverage, or selection of suboptimal plans, highlighting the limitations of the rational-choice framework (O'Donoghue & Rabin, 1999; Baicker et al., 2012).

Incorporating behavioural insights into the analysis of financial decision-making, therefore provides a more accurate and comprehensive understanding of consumer behaviour. By accounting for cognitive biases, heuristics, and time-inconsistent preferences, researchers and policymakers can better anticipate deviations from optimal choices and develop interventions, such as nudges or commitment mechanisms, to improve individual welfare and promote socially desirable financial behaviours.

2.4 Empirical Studies of Optimal Decisions

Bai and Jia (2022) conducted a study to explore how farmers' risk attitudes and e-commerce interest rates influence the optimal decisions of both parties. Considering the uncertainty in the agricultural supply chain outputs, they developed a Stackelberg game model under different financing strategies to determine optimal decisions for e-commerce platforms and farmers. Their findings indicated that farmers with lower risk aversion are more inclined to adopt e-commerce financing when interest rates are relatively low, reflecting an optimal choice under such conditions. Conversely, higher level of risk aversion among farmers lead to reduced production inputs and lower purchase prices at equilibrium, representing less favourable optimal decisions for both farmers and e-commerce platforms. Their findings contribute to the literature by highlighting the significant role of risk attitudes

in shaping economic decision-making under uncertainty, thereby extending the understanding of how behavioural factors influence optimal financial decisions across various domains.

Moreover, Chua et al. (2021) conducted a study on the suboptimal decisions of panic buying. They extended the health belief model by incorporating perceived scarcity and anticipated regret theories. Data were collected from 508 consumers in Singapore through an online survey administered during the early stage of the pandemic, before the onset of the circuit breaker in April 2020. Using structural equation modelling, the results revealed that perceived scarcity and anticipated regret had a significant positive effect on suboptimal decisions of panic buying. The consumers believed that purchasing necessary items immediately was an optimal decision to minimise potential regret later; however, this perception ultimately resulted in a suboptimal decision of panic buying behaviour. Their findings offer valuable insight for the present study by illustrating how psychological perceptions such as scarcity and anticipated regret can distort rational judgment and lead individuals to make suboptimal decisions that may occur in other financial decision-making contexts.

Napu et al. (2025) also developed a study to investigate the role of financial literacy and financial self-efficacy in influencing optimal decisions related to financial management behaviour in small-scale agribusiness. Using an explanatory research design, they surveyed around 68 small-scale agribusiness actors in Kendari City through a structured questionnaire. and analysed the data with PLS-SEM. The findings revealed that higher level of financial literacy promote more rational and optimal decisions regarding financial management behaviour. Additionally, financial self-efficacy also plays a crucial role in making optimal decisions regarding financial management. However, the study's limited sample size and focus on small-scale agribusiness actors restrict the generalisability of its findings to broader financial contexts and more complex decision-making environments

Mulyasana et al. (2020) also conducted a study to investigate the effect of organisational characteristics on optimal decisions among leaders in local government in Java by using structural equation modelling as the analytical method. The results found that organisational characteristics exert a positive effect on leaders' ability to make optimal decisions. Specifically, the findings provide empirical evidence that the more adequate and

supportive an organisation's characteristics are, the more optimal the decisions of the leader tend to be. Their findings contribute to the existing literature by highlighting the critical role of organisational attributes shaping decision quality within public sector contexts.

Besides, Na et al. (2019) examined optimal decision-making in the automotive industry, specifically in determining the optimal quantity of returnable packaging. Their findings highlighted that in supply chains with longer operations and greater demand and lead time variability, purchasing more returnable packages minimises costs and enhances efficiency. Conversely, in shorter operations with higher uncertainty, the benefits of returnable packages are more limited. This highlighted the broader relevance of making optimal decisions based on environmental conditions and risk factors, a concept that applies not only to logistics but also to financial decision-making. For instance, in life insurance purchasing behaviour, individuals must optimise coverage by balancing financial uncertainty and expected duration of need, ensuring decisions align with their specific circumstances.

In addition, Ahn et al. (2007) emphasised the role of attitude in guiding optimal decisions of job selection, particularly in uncertain and dynamic environments. By introducing a decision-theoretic model, the study demonstrated how attitudes toward proactive behaviour, potential risk, and reward influence job selection and payoff maximisation. While this framework effectively highlights the psychological dimensions of decision-making, it assumes a linear relationship between attitude and optimal decisions of job selection, potentially oversimplifying the complexities of labour market dynamics. External constraints such as structural unemployment, skill mismatches, and economic fluctuations may also shape job selection in ways that the model does not fully address.

Furthermore, Lee (2017) conducted a focus group study on optimal decisions regarding the use of Alternative Dispute Resolution (ADR) in the Malaysian construction industry by integrating TPB with extended behavioural theories. The study, involving 128 respondents, found that attitude is the primary predictor of optimal decisions regarding ADR use, with perceived relative advantage and perceived ease of use significantly influencing attitude. Although the findings highlighted the importance of attitude in decision-making, the study might identify other factors like organisational culture and institutional constraints, which may also affect ADR adoption.

2.5 Research Framework

This study has adopted TPB and integrated it with the hyperbolic discounting model to enhance a better understanding of the optimal decisions of life insurance purchasing behaviour (OD) among households in Malaysia. According to TPB, the consumers' intention is the immediate determinant of their actual decision-making regarding a specific behaviour, which is influenced by attitude, subjective norms, and perceived behavioural control. According to Ajzen (1985), an individual's attitude, subjective norm, and perceived behavioural control affect actual decisions through behavioural intention. Therefore, this study treats the intention to make the optimal decisions for purchasing life insurance (INT) as a mediating variable for the relationships between attitude towards life insurance (ATT), subjective norm (SN), perceived behavioural control (PBC), financial literacy (FL), perceived risk (PR), and optimal decisions of life insurance purchasing behaviour (OD).

The inclusion of FL and PR into TPB is necessary to overcome the model's limitations in explaining complex financial decisions. FL functions as a critical enabler of rational decision-making, reducing reliance on heuristics or misconceptions and leading to more optimal outcomes in life insurance purchasing within TPB. Conversely, PR reflects the psychological uncertainties and potential losses that may hinder individuals from making optimal decisions, despite holding favourable evaluations within TPB. By extending TPB with FL and PR, this study provides a more comprehensive framework that reflects the real barriers and enablers influencing optimal decisions of life insurance purchasing behaviour, particularly in the Malaysian context, where low literacy and high perceived risk remain major challenges.

ATT represents individuals' positive beliefs and feelings about life insurance, influencing their OD through INT (Ajzen et al., 2018) or directly affecting their OD (Roy, 2015; Lee, 2017). Consumers who hold a positive view of insurance, recognising it as a valuable tool for safeguarding their financial well-being and protecting their loved ones, are more motivated to engage in OD by evaluating potential benefits and ensuring their choices align with long-term financial goals.

Besides, the variable of SN is applied in this study to examine how perceived social expectations and approvals from social circles (family, peers, neighbours, or significant others) influence individuals in making OD, either directly (Raza et al., 2020) or through INT (Mafabi et al., 2017). When individuals believe that their friends and family support life

insurance products, they are more likely to make OD. Their beliefs contribute to a shared understanding of the acceptability of life insurance products, fostering a sense of social pressure to conform to these positive expectations. In simpler terms, when people perceive support for responsible financial planning through life insurance from their social circles, it significantly impacts their OD, aligning their choices with the positive beliefs and expectations of those around them.

In TPB, PBC significantly influences OD directly (Ismail et al., 2023) and through the mediating role of INT (Mafabi et al., 2017). When individuals feel confident in their ability to understand the complexities of life insurance and believe they have control over making the best decision (Bauer et al., 2018), it positively impacts their OD, both directly and through the mediating role of INT.

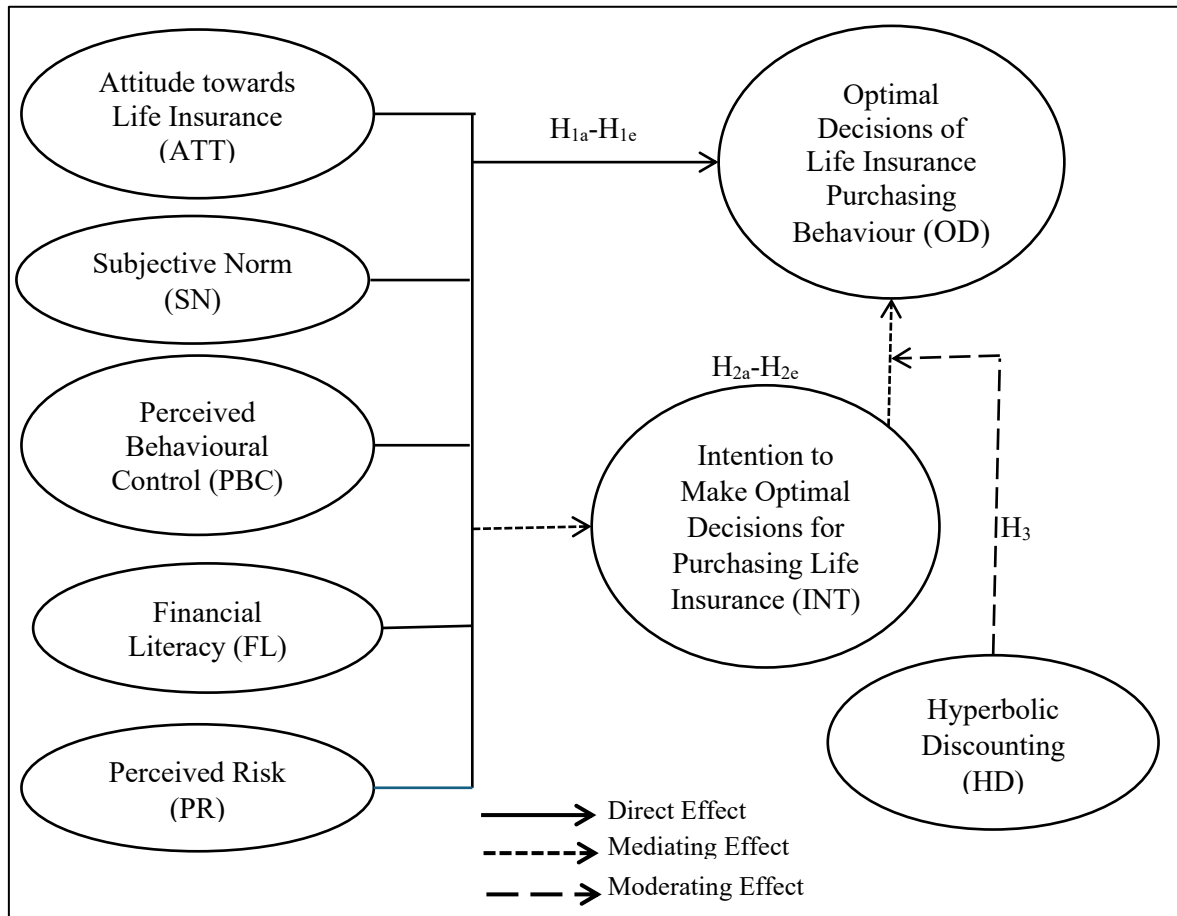
In addition, FL is incorporated into the TPB framework. In this study, FL is crucial in making informed and optimal financial decisions, such as purchasing life insurance (Rehman & Mia, 2024). Financial concepts are essential for consumers to understand the details of multiple insurance policies, compare coverage options, evaluate premium costs, and assess long-term benefits (Pitthan & De Witte, 2021). Within TPB, FL plays a crucial role in strengthening both INT and OD. Higher level of FL enhance consumers' confidence and positive evaluation of life insurance, which in turn increases their INT and ultimately leads to more OD. Additionally, individuals with higher FL are better equipped to evaluate long-term benefits, view life insurance premiums as a valuable investment rather than an immediate expense, and resist short-term preferences. As a result, when FL is high, the disruptive role of HD on the relationship between INT and OD is reduced, allowing consumers to follow through on their intentions and make more optimal decisions.

Furthermore, the PR variable is also included in the TPB framework due to its significant role in decision-making processes, particularly in areas such as life insurance (Raut & Kumar, 2024). PR encompasses uncertainties and potential drawbacks associated with a decision, influencing how individuals evaluate potential consequences (Khasbulloh & Suparna, 2022). Within TPB, high level of perceived risk may create negative attitudes toward life insurance and decrease confidence in one's ability to manage policies, thereby weakening the formation of INT and ultimately reducing the likelihood of making optimal decisions. Additionally, when PR is high, the disruptive role of HD on the relationship

between INT and OD is strengthened, as fear and uncertainty further discourage individuals from acting on their intentions, resulting in a greater intention-behaviour gap.

HD is also incorporated into the proposed framework as the moderating variable in this study. Consumers may exhibit present bias and time-inconsistent preferences, leading to less OD. Present bias (the tendency to prioritise immediate rewards over future benefits) might lead individuals to delay the purchase of a policy, as the benefits are realised in the future and might not be seen as immediately rewarding (Poon et al., 2017; Zielonka & Szymanek, 2023). Time-inconsistent preferences suggested that individuals might struggle to align their long-term goals, such as financial protection for their loved ones through life insurance, with their short-term desires (Grenadier & Wang, 2007; Huang et al., 2023). As a result, they may postpone purchasing, choose insufficient coverage, or select inappropriate insurance policies, neglecting the long-term benefits and protection that comprehensive life insurance can offer to their families in the future. Additionally, behavioural economic proposed hyperbolic discounting as a reason for the intention-decision discrepancy (Adnan et al., 2017). Figure 2-3 displays the proposed research framework in this study.

**Figure 2-3:
Proposed Research Framework**



2.6 Hypotheses Development

Three main hypotheses were developed in this study to explain the causal relationships outlined in the proposed research framework. The following subsection presents the hypotheses development for this study.

2.6.1 Attitude towards Life Insurance (ATT) and Optimal Decisions of Life Insurance Purchasing Behaviour

Attitude towards life insurance (ATT) represents a combination of feelings and thoughts that shape an individual's ability to respond positively or negatively towards life insurance products (Ajzen & Driver, 1991). Schiffman and Kanuk (2000) defined attitude as a learned inclination to behave consistently in a favourable or unfavourable manner regarding life insurance. Similarly, Kotler and Gertner (2007) stated that individuals held attitudes towards almost everything, such as food, music, and clothing. Attitude plays a

crucial role in consumer behaviour, as it influences consumers to make optimal decisions regarding the purchase of their preferred products, including life insurance (Mbada et al., 2013; Chowdhury & Humaira, 2024).

However, the relationship between attitude and actual decision-making has been questioned by previous scholars, particularly regarding whether attitude consistently predicts actual decisions regarding a specific behaviour (Kim & Hunter, 1993; Zhuo et al., 2022). Although Kant et al. (2023) suggested that consumer attitudes towards a company and its products significantly affected the achievement of the company's marketing policy, this influence was not always direct. The effectiveness of attitude in driving actual decisions depended on several mediating factors, such as knowledge, experience, situational context, and personality traits (Vermeir & Verbeke, 2008; Ajzen et al., 2018). This complex interplay implied that although attitude was crucial, its impact on behaviour could vary significantly based on external and internal factors.

Individuals with a negative ATT might perceive the likelihood of premature death as highly improbable (Bauer & Schmidt, 2025). The consumers might overestimate their chances of experiencing positive events, such as living a long, healthy life and underestimate the risks of negative events, such as unexpected illness or accidents. This negative ATT could lead them to underestimate the potential financial risks associated with unforeseen events, thereby discouraging the purchase of life insurance. As a result, individuals might fail to recognise the long-term financial security and protection that life insurance provided, hindering optimal decision-making. Previous studies have shown that factors such as marital status, work experience, and nature of employment could influence an individual's ATT, which in turn affected OD (Gakhar, 2019; Brooks & Williams, 2024).

In addition, Warayanti and Suyanto (2015) employed a quantitative method through SEM analysis and applied a convenience sampling technique for data collection. Based on SEM analysis, consumer attitudes provided a positive influence but were not significant in optimal decisions towards purchase behaviour. This finding aligned with the results of Hartono et al. (2025), which also revealed no significant impact of consumer attitudes on rational and optimal planning. Thus, further exploration of the non-significant impact is required as it can provide insights into the nuances of the relationship between consumer attitudes and optimal decisions towards purchase behaviour.

However, behavioural studies investigating the direct relationship between ATT and OD are limited in the current literature. Ajzen and Fishbein (2005) argued that the previous studies faced challenges in establishing strong connections between attitudes and final decisions, which they attributed to an incompatibility in the level of generalisation at which these variables were evaluated. Hence, this study proposed a relationship between ATT and OD:

H_{1a}: Attitude towards life insurance has a positive effect on the optimal decisions of life insurance purchasing behaviour.

2.6.2 Subjective Norm (SN) and Optimal Decisions of Life Insurance Purchasing Behaviour

A subjective norm (SN) refers to the social pressure exerted by friends, peers, and family to engage in a particular decision (Raza et al., 2020; Dinç et al., 2025). The intensity of this pressure can vary based on the social dynamics of the community (Amron, 2018). SN plays a crucial role in consumer behaviour, as it can influence an individual's decision-making process that often shape perceptions of what is considered acceptable or desirable. However, the studies by Schultz et al. (2007) and Schultz et al. (2018) have shown that individuals frequently underestimated or ignored the influence of others on their decisions, particularly when those decisions were perceived as harmful or potentially disadvantageous. This suggested a complex interaction between social pressure and personal decision, where individuals might minimise external influences in favour of their personal judgment.

Shamsie (2024) revealed that peer influence could positively affect lifestyle decisions, social interaction, and performance, suggesting that peers could play a crucial role in facilitating optimal decision-making. Similarly, Rollings et al. (2023) emphasised that individuals high in extraversion could use their social networks to gather diverse perspectives, aiding in optimal decisions. Although both studies highlighted the positive influence of peer interaction and personality traits like extraversion on decision-making, these perspectives might be vulnerable to the risks of conformity or groupthink, where social dynamics inhibited critical evaluation and led to suboptimal outcomes.

Besides, Lee et al. (2021) suggested that social networks could guide optimal decision-making in life insurance investments. These social networks could create a learning environment where individuals adjusted their strategies based on the observed actions of

friends, peers, or neighbours. It is also supported by Wirawan et al. (2022), who stated that SN positively influenced investment decisions, indicating that external pressures from observers and friends could enhance individuals' ability to make optimal decisions, including the purchase of life insurance. However, reliance on social networks might also lead to heuristic-based decisions or imitation without critical evaluation, potentially compromising the quality of decisions in situations that required accurate information and professional guidance, such as choosing medical treatments, making investment decisions, or selecting higher education programs.

Furthermore, Wan Azmi et al. (2015) discovered that 65 percent of Generation Y in Malaysia relied more on family, friends, and co-workers for financial advice than on professional advisors when it came to life insurance purchases. This finding might raise concerns, as non-professional sources might lack the necessary expertise to effectively guide individuals towards the best financial decisions. The study also noted that only 37 percent and 33 percent of Generation Y sought advice from banks and financial advisors, respectively. Although the reliance on informal sources was understandable, it might limit individuals' access to comprehensive, expert financial advice, potentially leading to suboptimal decisions.

In addition, parents also play a pivotal role in shaping financial decisions, particularly when it comes to OD. Norvilitis and MacLean (2010) found that younger generations often sought financial advice from their parents, including guidance on decisions such as purchasing life insurance. Similarly, Aisjah (2024) revealed that parental guidance on financial matters played a crucial role in shaping the financial behaviour of college students. However, Wrottesley (2016) pointed out a limitation of parental influence, noting that when parents did not provide sufficient financial education, young individuals might lack an essential understanding of key financial concepts, such as interest rates and risk diversification. This lack of understanding could lead to suboptimal decision-making, suggesting the need for more comprehensive financial education at an early age. Based on the above literature, the following hypothesis was proposed:

***H_{1b}:** Subjective norm has a positive effect on the optimal decisions of life insurance purchasing behaviour.*

2.6.3 Perceived Behavioural Control (PBC) and Optimal Decisions of Life Insurance Purchasing Behaviour

Perceived behavioural control (PBC) plays a critical role in shaping individuals' optimal decision-making regarding life insurance purchases (Ismail et al., 2023). PBC is defined as one's perception of the ease or difficulty of performing a decision (Brahmana et al., 2018). PBC is influenced by personal experiences, knowledge, and external inputs such as advice from professionals or peers. A high level of PBC empowers individuals to make informed and optimal decisions, considering aspects like coverage, premiums, and beneficiaries. In contrast, low PBC can lead to suboptimal decisions or avoidance due to perceived barriers or uncertainties. However, structural barriers, such as unequal access to financial education or advisory services, can limit optimal decisions, even when individuals perceive a high level of control.

Yeow et al. (2021) emphasised the importance of confidence in navigating complex decisions, showing that high PBC reduced hesitation and supported long-term goal alignment. Maulana et al. (2018) further revealed that self-efficacy strengthened PBC and enhanced the likelihood of making optimal choices regarding Islamic insurance. These studies illustrated the positive relationship between confidence and decision-making, but overconfidence might also lead to heuristic-driven or misinformed decisions, highlighting a limitation in assuming that increased PBC consistently results in optimal outcomes.

Besides, Totura et al. (2019) explored PBC in the context of adolescent suicide prevention, finding that perceived control had a stronger influence on decision-making than intention. Similarly, Hanson et al. (2015) examined PBC in women's contraceptive choices, indicating that optimal decisions were closely aligned with women's reproductive goals, health considerations, and lifestyle preferences. Although these studies demonstrated the relevance of PBC in emotionally sensitive and health-related domains, financial decisions such as purchasing life insurance required considerations such as abstract risk assessment, delayed outcomes, and the influence of external factors such as market conditions.

The studies discussed above highlighted the significant role of PBC in guiding optimal decision-making across various domains. However, there is limited literature on how PBC influences optimal decisions in financial decisions, such as purchasing life insurance. While these studies offer valuable insights into PBC's impact on adolescent suicide prevention and women's birth control choices, they leave a gap in understanding its role in

financial decisions. Investigating the role of PBC in life insurance purchasing could provide key insights into how individuals make optimal decisions regarding coverage, premiums, and beneficiaries, ultimately enhancing their financial security and well-being. Thus, the following hypothesis was developed:

H_{1c}: Perceived behavioural control has a positive effect on the optimal decisions of life insurance purchasing behaviour.

2.6.4 Financial Literacy (FL) and Optimal Decisions of Life Insurance Purchasing Behaviour

Previous studies have significantly contributed to the understanding of financial literacy (FL) in consumer decision-making (Carlin & Robinson, 2012; Estelami & Florendo, 2021). Financially literate consumers possess the essential knowledge and skills to assess the advantages and disadvantages of various life insurance products, enabling them to make well-informed and optimal decisions. This literacy equips individuals with a comprehensive understanding of available insurance options, ultimately fostering their OD. Setyorini et al. (2021) defined FL as the capability to manage finances efficiently, including wealth accumulation, preservation, and distribution in later stages of life. Lin et al. (2017) also emphasised that FL was crucial for making optimal decisions related to investments, debt management, and overall financial planning. These findings collectively highlighted the significant role of FL in improving decision-making and enhancing financial outcomes, although the degree to which FL influenced decision-making might vary across different populations.

The institutional environment also played a significant role in facilitating optimal financial decisions by determining the availability and quality of information on insurance products (Abdul Kareem et al., 2023). Government and public policymakers have raised concerns about low FL across OECD countries, with individuals from various income and education levels facing difficulties. Many consumers struggled with complex concepts such as risk diversification, inflation, compound interest, and budgeting, which often resulted in suboptimal financial decisions. Although institutional efforts to enhance FL were essential, they often neglected the impact of cognitive biases, emotional factors, and structural barriers, such as unequal access to resources, which can still lead to suboptimal financial decision-making, even with increased knowledge.

The conventional finance model has assumed that all consumers possessed the necessary psychological, physiological, and informational capabilities, operating in an ideal governance and social environment, which enabled them to make optimal decisions (Altman, 2020; Ernst & Gleißner, 2022). This assumption suggested that financial education might not be necessary, as individuals were presumed to always make rational and optimal decisions. However, behavioural finance challenged this view, arguing that individuals did not inherently behave as rational agents and that the decision-making environment was not always ideal. Behavioural finance emphasised the role of cognitive biases and emotional factors in shaping optimal decisions, such as purchasing life insurance, which the conventional model fails to account for.

Fong et al. (2021) found a positive correlation between FL and financial behaviour, particularly in investment decisions, including insurance products. This suggested that financial education could improve individuals' ability to assess financial information, increasing their capacity to make informed and optimal decisions. Similarly, Scholnick et al. (2013) also highlighted the importance of education in enhancing FL, especially in situations involving infrequent or complex decisions, such as purchasing life insurance. Moreover, Bustani (2024) also demonstrated that a higher level of FL allowed individuals to better understand the risks and benefits of investments, reducing misconceptions and fear-driven choices and ultimately leading to more optimal financial outcomes. In contrast, Dunn (2023) revealed that even with high FL, consumers might still lack access to current and precise information, given the complexities and unpredictability of financial markets.

According to the above literature, this study proposed a positive correlation between financial literacy and optimal decisions of life insurance purchasing behaviour. Therefore, the following hypothesis was formed:

H_{1a}: Financial literacy has a positive effect on the optimal decisions of life insurance purchasing behaviour.

2.6.5 Perceived Risk (PR) and Optimal Decisions of Life Insurance Purchasing Behaviour

Perceived risk (PR) refers to the concern or unfavourable perception consumers have regarding a product or service, often arising from uncertainty or fear of negative outcomes

during the purchasing process (Wai et al., 2019; Raza et al., 2020). In the context of life insurance, this risk is amplified due to the complexity of policies, which often contain numerous terms, conditions, and options that may confuse potential buyers (Ghimire & Ghimire, 2024). The complexity of life insurance policies, coupled with the high financial commitment involved, increases the likelihood of suboptimal decision-making, as consumers may struggle to identify the policy that best suits their needs.

People may respond to perceived hazards in ways that are not always rational or accurate. Inaccurate risk perceptions can lead to misguided personal, public, or environmental protection efforts. Assessing risk, especially for services or products such as life insurance, often requires intricate epidemiological and experimental studies (Slovic et al., 2016). However, when interpreting complex statistical data, humans tend to rely on cognitive shortcuts, which can result in biases by oversimplifying or distorting the information, thereby affecting decision-making.

Sum and Nordin (2018) suggested that insurance purchasers might overestimate or underestimate certain risks, relying heavily on past experiences, which might not always be reliable predictors of future outcomes. For instance, even if a consumer's previous experience with an insurance product was negative, they might generalise that experience to all future insurance purchases. This cognitive bias, known as associative activation, led to the formation of a causal link between unrelated events. For example, an individual who has had a negative experience with motor insurance might begin to associate all insurance products with potential negative outcomes. This generalisation could hinder optimal decision-making, preventing the individual from objectively evaluating the benefits and risks of life insurance.

Naicker and Van Der Merwe (2018) further emphasised that consumers' beliefs about life insurance were often shaped by PR. Many consumers expressed concerns about the financial risks associated with life insurance, which could result in hesitation when making decisions. These PR included complex legal jargon, the potential for claim denials without clear explanations, misleading advertising, and delayed claims processing (O'Donoghue & Rabin, 2003; Aldammagh et al., 2021). Such uncertainties led to a lack of trust and confidence in insurance companies, which subsequently reduced the likelihood of making an optimal decision.

Jain et al. (2023) discovered that PR was often shaped by an individual's confidence level in their decision-making abilities. Individuals who lacked confidence due to uncertainty about their understanding of the financial product or fear of making a suboptimal decision, might become overly cautious or paralysed by doubt, resulting in hesitation or avoidance in making optimal decisions. It is also suggested by Peters (2022), who showed that lower confidence could heighten PR, leading to less optimal decision-making.

Based on the literature discussed above, this study proposed an association between perceived risk and optimal decisions of life insurance purchasing behaviour. The following hypothesis was developed:

H_{1e}: Perceived risk has a negative effect on the optimal decisions of life insurance purchasing behaviour.

2.6.6 Mediating Role of Intention to Make Optimal Decisions for Purchasing Life Insurance (INT)

The research framework is expanded by INT for the relationships of ATT, SN, PBC, FL, PR, and OD. According to the TPB, behavioural intention is the most immediate predictor of actual decisions regarding a specific behaviour and thus serves as a logical mediator linking attitude to final decision-making outcomes. Previous studies have neither analysed the direct relationship between attitude and actual behaviour nor the mediation mechanism of behavioural intention in such a relationship (Wu & Zhu, 2012; Mafabi et al., 2017). However, Alfiero et al. (2022) revealed a significant mediating role of intention between attitude and purchase decisions. It is also supported by Cai and Shannon (2012) and Yu et al. (2021) discovered that the relationship between attitude and final decisions was mediated by behavioural intention, stating that attitude affected the strength of behavioural intention, influencing actual decisions. Thus, this study proposed a relationship between ATT and OD through INT.

Most studies have suggested that the influence of SN on actual decision-making was mediated by behavioural intentions (Lim et al., 2016; Mafabi et al., 2017; Alfiero et al., 2022). Jamil and Mat (2011) proposed that SN did not exert a direct, significant impact on actual decisions regarding specific behaviours but significantly influenced behavioural intention. They also found that the influence of family, friends, and media on actual decisions

was relatively minor. Furthermore, SN was identified as the second most influential factor in shaping behavioural intention after PBC. This suggested that the effect of SN on actual decision was not direct but rather operates through its influence on behavioural intention. Therefore, this study proposed an association between SN and OD through the mediating role of INT.

Mafabi et al. (2017) demonstrated a significant relationship between PBC and actual behaviour, mediated by behavioural intention, which played a key role in guiding individuals toward optimal decision-making. Similarly, Sultan et al. (2020) found that intention partially mediated the relationship between PBC and optimal decisions, highlighting intention as a crucial link in the decision-making process. Reychav and Weisberg (2009) expanded this view by showing that domain-specific expertise enhanced PBC, which in turn strengthened behavioural intention and increased the likelihood of making optimal decisions. However, Alfiero et al. (2022) stated that intention did not significantly mediate the relationship between PBC and purchasing decisions, indicating that the pathway from PBC to optimal decisions might not always operate through intention. This inconsistency suggested that the mediating role of intention between PBC and optimal decision-making might be influenced by moderating factors, such as FL or PR.

Peiris (2021) highlighted that behavioural intention plays a partial mediating role for the relationship of FL and actual decisions. It is supported by Widjaja et al. (2020), who found that FL affects optimal decisions of saving behaviour both directly and indirectly via intention, emphasising that understanding and managing financial risks contributes to more informed and optimal decisions. However, Wahyuni and Hafiz (2023) found that the relationship between FL and financial decisions is not mediated by intention among undergraduates in North Sumatra, indicating that FL can also lead directly to financial decisions. Therefore, this study proposed a relationship between FL and OD through the mediating role of INT.

Several studies have revealed a significant association between PR and actual decisions through the mediating role of behavioural intention (Bhatti & Rehman, 2019; Masud et al., 2021; Qi et al., 2021; Alfiero et al., 2022). These findings indicated that higher level of PR might reduce behavioural intention, leading to less optimal decision-making. Therefore, this study proposed a relationship between PR and OD through INT. Based on the literature discussed above, the following hypotheses were developed:

H_{2a}: Intention to make optimal decisions for purchasing life insurance mediates the relationship between attitude towards life insurance and optimal decisions of life insurance purchasing behaviour.

H_{2b}: Intention to make optimal decisions for purchasing life insurance mediates the relationship between subjective norm and optimal decisions of life insurance purchasing behaviour.

H_{2c}: Intention to make optimal decisions for purchasing life insurance mediates the relationship between perceived behavioural control and optimal decisions of life insurance purchasing behaviour.

H_{2d}: Intention to make optimal decisions for purchasing life insurance mediates the relationship between financial literacy and optimal decisions of life insurance purchasing behaviour.

H_{2e}: Intention to make optimal decisions for purchasing life insurance mediates the relationship between perceived risk and optimal decisions of life insurance purchasing behaviour.

2.6.7 Moderating Role of Hyperbolic Discounting (HD)

The intention-decision gap, also known as the intention-behaviour or value-action gap, is a common phenomenon in various domains, including health behaviour change, exercise, and environmental behaviour (Sheeran & Webb, 2016; Enste & Altenhöner, 2021). The gap arises from the discrepancy between one's intentions and actual decisions, with current evidence suggesting that intentions were translated into decisions approximately half of the time (Celik & Cagiltay, 2024). Several factors, including time-related obstacles, can complicate the intention-decision relationship. According to Fishbein and Ajzen (2011), a broader time interval weakened the connection between intention and actual decisions, as the extended time frame increased the chances of unforeseen circumstances influencing changes in intentions and actual decisions. This often leads to a larger gap between intention and actual decisions (Hulland & Houston, 2021).

One key factor contributing to the intention-decision gap is self-regulatory problems, which may prevent individuals from acting on their intentions. Sheeran and Webb (2016)

identified self-regulation issues as a primary reason why consumers failed to engage in actual decisions despite forming intentions to do so. When time is a significant factor, behavioural biases, particularly those favouring immediate gratification, further complicate this relationship.

In this study, hyperbolic discounting (HD) acts as a moderator in the relationship between one's intention to make optimal decisions for purchasing life insurance and the actual optimal decisions of life insurance purchasing behaviour. TPB proposed that intention is the immediate antecedent of behaviour, assuming individuals act rationally once they form an intention (Ajzen & Driver, 1991). However, TPB does not fully account for the intention-behaviour gap, particularly in financial decision-making. Behavioural economics addresses this limitation by recognising cognitive biases, such as hyperbolic discounting model, which lead individuals to prioritise short-term gains over long-term benefits (Oliveira & Green, 2012; Bawalle et al., 2024). HD introduces temporal inconsistency, meaning the value placed on long-term outcomes, such as financial security from life insurance declines as the time to realise these benefits increases (O'Donoghue & Rabin, 2000; Enke & Graeber, 2021). Consequently, even when consumers form strong intentions, HD weakens follow-through by increasing the demand of immediate gratification over delayed benefits. Thus, in this study, HD is proposed to moderate the intention-behaviour relationship, as predicted by TPB, by explaining why some consumers fail to convert their intentions into optimal decisions of life insurance purchasing behaviour.

In the aspect of decision-making, HD manifested as a preference for smaller, immediate rewards, leading individuals to prioritise instant gratification, such as spending on non-essential luxuries rather than investing in long-term financial plans like life insurance (Ericson & Laibson, 2019). This behaviour often results in suboptimal outcomes, including higher future costs through increased premiums, additional fees, or limited coverage when life insurance is eventually needed. It reflects the concept of bounded rationality, where decision-making is constrained by psychological, cognitive, and informational limitations, despite consumers having some level of knowledge or awareness.

Thus, based on the literature discussed above, the moderating role of HD influences both the strength and potentially the direction of the relationship between INT and OD. When HD is low, the relationship between INT and OD tends to be strong and positive, as individuals are more likely to follow through on future-oriented plans. Conversely, when

HD is high, the relationship weakens due to the preference for immediate rewards. Therefore, this study proposed a significant moderating role of HD in the association between INT and OD.

H₃: The positive relationship between the intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour is stronger for lower hyperbolic discounting.

2.7 Summary of Research Hypotheses

Based on the reviews and preceding discussion above, three main hypotheses were developed in this study. Table 2-1 presents a list of all the hypotheses developed:

**Table 2-1:
List of Hypotheses Development**

Hypotheses	Hypotheses Statement
H _{1a}	Attitude towards life insurance has a positive effect on the optimal decisions of life insurance purchasing behaviour.
H _{1b}	Subjective norm has a positive effect on the optimal decisions of life insurance purchasing behaviour.
H _{1c}	Perceived behavioural control has a positive effect on the optimal decisions of life insurance purchasing behaviour.
H _{1d}	Financial literacy has a positive effect on the optimal decisions of life insurance purchasing behaviour.
H _{1e}	Perceived risk has a negative effect on the optimal decisions of life insurance purchasing behaviour.
H _{2a}	Intention to make optimal decisions for purchasing life insurance mediates the relationship between attitude towards life insurance and optimal decisions of life insurance purchasing behaviour.
H _{2b}	Intention to make optimal decisions for purchasing life insurance mediates the relationship between subjective norm and optimal decisions of life insurance purchasing behaviour.
H _{2c}	Intention to make optimal decisions for purchasing life insurance mediates the relationship between perceived behavioural control and optimal decisions of life insurance purchasing behaviour.
H _{2d}	Intention to make optimal decisions for purchasing life insurance mediates the relationship between financial literacy and optimal decisions of life insurance purchasing behaviour.
H _{2e}	Intention to make optimal decisions for purchasing life insurance mediates the relationship between perceived risk and optimal decisions of life insurance purchasing behaviour.
H ₃	The positive relationship between the intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour is stronger for lower hyperbolic discounting.

2.8 A Remark

In this chapter, the relevant theory and model for the study were initially highlighted. Then, it continued with a detailed explanation of OD, followed by the research framework. This chapter also covered hypothesis development, including the literature review on the seven constructs that led to OD: ATT, SN, PBC, FL, PR, HD, and INT.

Prior research has largely concentrated on attitude, subjective norm, and perceived behavioural control as the principal determinants of intention and actual behaviour within the framework of TPB (Ajzen, 1985; Fan et al., 2021). However, insufficient attention has been given to incorporating financial literacy and perceived risk, creating a notable gap that this study addresses by extending TPB to better explain optimal decisions of life insurance purchasing behaviour. Moreover, although TPB is a well-established framework for explaining behavioural intentions, it has seldom integrated constructs derived from behavioural economics.

Behavioural economic concepts, such as HD, have been applied to explain time-inconsistent preferences; however, their moderating role in the relationship between intention and actual optimal decisions remains underexplored. Similarly, the mediating role of intention in the relationship between key variables and OD has not been thoroughly examined. Furthermore, there is limited empirical research focusing specifically on Malaysian households despite the country's relatively low life insurance penetration rate. By incorporating hyperbolic discounting as a moderating variable within the TPB framework, this study aims to bridge this gap and provide a more holistic understanding of the determinants influencing OD.

CHAPTER 3:

RESEARCH METHODOLOGY

3.1 Introduction

Chapter 3 covers the methodology used in this study. This chapter begins by considering the study's paradigm, operational definition, research design, target population, sampling design, unit of analysis, sample size, data collection procedures, pilot study, and survey instruments. Then, it provides an overview of the statistical techniques used for data analysis and concludes with a summary.

3.2 Research Paradigm

Research paradigms are basic frameworks that influence the approach to inquiry, determining how researchers interpret and examine phenomena (Shah & Al-Bargi, 2013; Rehman & Alharthi, 2016). The main research paradigms are positivism, interpretivism, socio-critical, and pragmatism, which are widely recognised in academic research (Tschimmel & Pombo, 2018). Each paradigm includes perspectives on the nature of reality (ontology), the nature of knowledge (epistemology), and the techniques used for data collection and analysis (methodology).

This study focused on the research paradigm of positivism. Positivism involves concise, brief, and obvious discussion and does not require a descriptive statement from subjective interpretations or individuals' emotions. It is argued that there was a great debate on the issue of employing positivism and whether it is applicable to social science (Rahi, 2017).

Besides, positivism is mostly associated with the hypothetico-deductive model of science. Deductive reasoning is a logical approach which starts with a theory from the previous literature to develop hypotheses, plan an experiment through independent and dependent variables, and perform an empirical study based on experimentation (Park et al.,

2020). To test a theory, the researcher intended to collect the primary data from the respondents and analyse data with the use of statistical tests. The findings of this study were used to prove whether the hypotheses were supported or not and to contribute to the existing literature.

In addition, positivism is traditionally considered to be related to the quantitative approach (Ryan, 2006; Su, 2018). Positivists mostly select quantitative tools like social surveys, structured questionnaires, and official statistics as they have better reliability and representativeness. This study employed a quantitative approach, utilising numerical data to enhance efficiency in terms of resources and time (Eyisi, 2016). Imoh-Ita (2023) also argued that the quantitative approach focuses more on figures and numbers through collecting and analysing data. The collected data is calculated and presented in frequency, percentage, figures, or tables by a computer using statistical software. In quantitative research, generalisation is regarded as the main element to evaluate the quality of the study (Polit & Beck, 2010; Younas & Durante, 2023).

Furthermore, positivism relies on structured data collection methods, such as surveys, experiments, and observations, to obtain objective and measurable data (William, 2024). This study utilised an online survey with closed-ended questions. The online survey is cross-sectional, with data gathered at a single point in time due to the researcher's time constraints in completing the research.

3.3 Operational Definitions

The operational definitions of this study are:

1. **Attitude towards life insurance** is an individual's beliefs and feelings toward making optimal decisions about life insurance.
2. **Subjective norm** is the social pressures or expectations individuals perceive from significant others (such as family and friends) that influence their optimal decisions of life insurance purchasing behaviour.
3. **Perceived behavioural control** is an individual's confidence and sense of control in making optimal decisions about life insurance policies.

4. **Financial literacy** is an individual's understanding of financial concepts that guide optimal decisions in life insurance to achieve long-term financial goals.
5. **Perceived risk** is an individual's negative feelings about the potential negative outcomes of not making an optimal decision when purchasing a life insurance policy.
6. **Intention to make optimal decisions for purchasing life insurance** is an individual's plan and commitment to make optimal decisions about purchasing life insurance.
7. **Hyperbolic discounting** is the preference for immediate rewards over larger future benefits when making optimal decisions about life insurance policies.
8. **Optimal decisions of life insurance purchasing behaviour** are the process of evaluating and purchasing the best life insurance policy. In this study, the best life insurance is defined as a policy that offers adequate coverage, aligns with the policyholder's specific needs by selecting the right type of policy, minimises misinterpretation of insurance terms, and includes suitable riders to ensure comprehensive protection.

3.4 Research Design

Research design assists the researchers in developing effective and reliable techniques for collecting and analysing data to meet research objectives in the study (Asenahabi, 2019). The research design also helps to complete data collection and analysis with limited resources such as time taken and research budget. A well-planned research design helps to make sure that all proper data is gathered analytically and regularly.

This study applied a survey to meet the research objectives. A survey study is one of the data collection tools applied to gather data from the respondents of a targeted group to gain information and perceptions related to the research topic (Jain, 2021). The survey is generally suitable for collecting data from a larger sample size through a standardised questionnaire with closed or open-ended questions (Karunaratna et al., 2024). The survey method is cost-effective and can be developed within a limited time compared to other data collection tools. Thus, the survey method served as the main approach in this study. A list

of measurement items was generated after reviewing the literature related to the variables of attitudes towards life insurance, subjective norm, perceived behavioural control, financial literacy, perceived risk, intention to make optimal decisions for purchasing life insurance, hyperbolic discounting, and optimal decisions of life insurance purchasing behaviour, which meet the research objectives.

In this study, the survey was self-administered using Google Forms and distributed entirely online to the target respondents in Malaysia. The online survey allows the researcher to easily convert responses from Google Forms into a spreadsheet for data filtering, eliminating the need for manual processing. The online survey was cross-sectional, with data gathered at a single point in time due to the researcher's time constraints in completing the research.

Descriptive and inferential statistics were also applied in this study. Descriptive statistics are methods used to describe, present, and summarise the basic features of a dataset within a study (Fisher & Marshall, 2009; Alabi & Bukola, 2023). Inferential statistics involve hypothesis testing that allows researchers to draw generalisations, predictions, or conclusions about the entire population based on the samples (Kalish & Thevenow-Harrison, 2014; Stapor, 2020).

3.4.1 Population of the Study

This study was conducted in Malaysia, focusing on individuals from various states and federal territories. The first reason for selecting Malaysia is that the penetration rate of life insurance coverage remains relatively low compared to countries such as Taiwan, Japan, and Thailand (GlobalData, 2024). Besides, 90 percent of Malaysians lack adequate coverage for themselves and their families, although many are unaware of this deficit (Krishnan, 2020). Furthermore, Subramaniam and Gomes (2019) highlighted a deficiency in optimal decision-making among Malaysian consumers, revealing low acceptance and awareness of insurance as an essential component of wealth planning.

The target population refers to the specific group of individuals from whom researchers aim to gather data and draw conclusions. It plays an essential role in guaranteeing that the study addresses the research objectives effectively and stays within a well-defined scope (Barnsbee et al., 2018; Willie, 2024). Defining the target population is essential

because it guides the selection of participants, helps clarify the study's focus, and ensures that the data collected is relevant and applicable to the research objectives.

In this study, the target population consisted of households in Malaysia that have purchased life insurance, ensuring that the participants have a foundational understanding of life insurance policies. The term "households" refers to groups of family members living together and sharing resources such as food, utilities, and living expenses (Department of Statistics Malaysia, 2023; Godbole et al., 2025). Several criteria are important for selecting participants. Firstly, participants must be 18 years old or older, as under the Age of Majority Act 1971 (Act 21), the person is legally recognised as an adult at the age of 18 years old (Attorney General's Chambers of Malaysia, 2006). This age threshold indicates that the individuals have full legal capacity to enter into contracts or exercise other civic rights. Those participants should have a degree of financial stability, which is defined as the ability to meet basic living expenses through personal income or other financial resources, without relying on unsustainable debt or external financial assistance (Sabri et al., 2023; Katnic et al., 2024).

3.4.2 Sampling of the Study

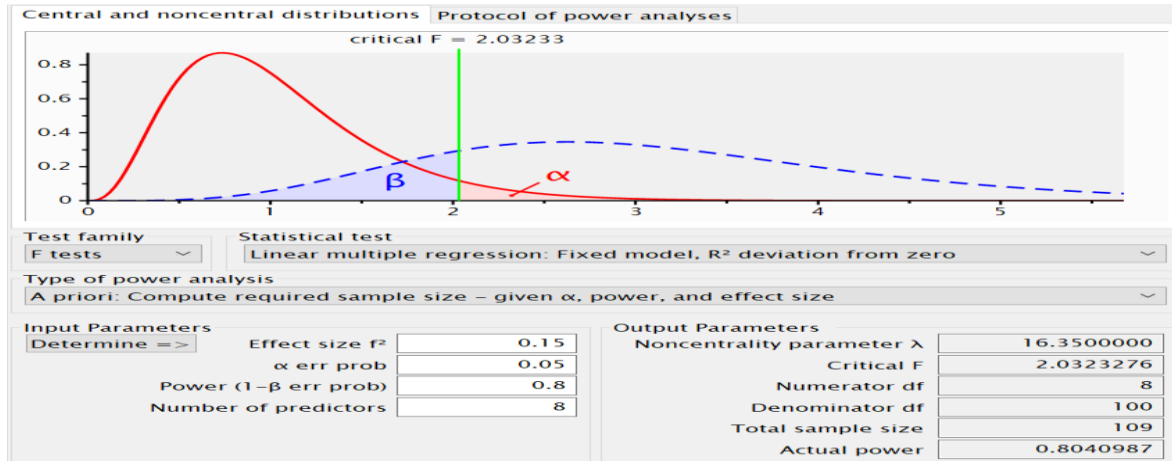
This study employed non-probability sampling, also known as non-random sampling, where not all individuals in the population have an equal chance of being selected to engage in this study (Ganesha & Aithal, 2022). Specifically, convenience sampling, one of the non-probability samplings, was used in this study. Convenience sampling involves collecting data from individuals who are easily accessible and available to the researcher (Simkus, 2023). Participants in the sample were selected based on accessibility rather than representativeness of the entire population, making convenience sampling an appropriate choice. This sampling is crucial in collecting large samples when there is a time constraint, as it is a simple method and requires minimal effort (Golzar et al., 2022). Moreover, convenience sampling was necessary in this study due to the absence of a publicly available database of life insurance consumers and restrictions on accessing consumer information from life insurance companies. Examples of convenience sampling include recruiting acquaintances, distributing physical surveys in nearby areas, and sharing the survey through email or social media platforms.

Snowball sampling, a non-probability sampling technique, was combined with convenience sampling in this study (Newton, 2024; Lappeman et al., 2025) to further minimise bias and increase diversity (Vincent & Thompson, 2022). Since the initial convenience sample is largely composed of participants aged 18 to 37 years old, the older age groups are underrepresented, which may result in sampling bias and limit the generalisability of the findings (Danie et al., 2024). Thus, a snowball sampling was applied in this study to gain respondents aged 38 years old and above. After recruiting the initial participants, they were encouraged to refer to their relatives, friends, or colleagues who are aged 38 years old and above to meet the study's criteria. Then, those new participants would be asked to refer others, continuing the snowball sampling process. This chain of referrals can help extend the reach of the study beyond the initial convenience sample and spread different social networks, helping to diversify the participant base and reduce sampling bias. Thus, convenience sampling provides an initial pool of participants, while snowball sampling expands the reach through referrals, helping to reduce selection bias and improve representativeness.

3.4.3 Sample Size

The G*Power software was utilised in this study to determine the minimum required sample size. G*Power is a user-friendly tool that calculates sample size and statistical power for various tests, including t-tests, regression analysis, ANOVA, correlation analysis, and so on (Kang, 2021). In this study, a regression F-test was conducted using G*Power. Four key variables were specified to perform the power analysis: effect size, significance level (α), statistical power, and the total number of predictors. According to Bolarinwa (2020), a statistical power of 0.8 is considered sufficient for social science research. For the multiple regression test, Cohen (1988) suggested that the effect sizes f^2 of “small”, “medium”, and “large” are 0.02, 0.15, and 0.35, respectively. Most studies tend to employ a medium effect size when conducting power analysis using G*Power, particularly in the absence of prior empirical evidence (Cohen, 1988; Tiller et al., 2025). Thus, the sample size in this study was calculated using medium effect size, 0.15. For this study, with a medium effect size of 0.15, a significance level of 0.05, a statistical power of 0.8, and eight predictors, the analysis indicated that the minimum required sample size was 109, as stated in Figure 3-1.

**Figure 3-1:
Minimum Sample Size of G*Power**



SEM is also regarded as a multivariate statistical technique that requires a minimum sample size of 200 (Dash & Paul, 2021). Therefore, the minimum sample size for this study was 200 to meet the requirements of SEM. The researcher collected 304 valid samples in this study. A larger sample size improves the likelihood that the sample is representative of the broader population, thereby enhancing the generalisability of the study's findings (Stratton, 2021). Additionally, a larger sample size increases statistical power, reducing the risk of Type II errors, particularly in SEM, where detecting complex relationships between variables requires sufficient power (Hamad & Ahmed, 2025). By exceeding the minimum required sample size of 200, the researcher strengthened the robustness, reliability and generalisability of the study's findings.

3.5 Unit of Analysis

The unit of analysis refers to the specific population or group of individuals that researchers examine in their studies (Damşa & Jornet, 2021). The unit of analysis in this study is households in Malaysia that have purchased life insurance. To ensure that the households have purchased life insurance, the researcher established clear eligibility criteria during data collection. Specifically, the study focused on members of households who were 18 years or older and had a certain degree of financial stability, allowing them to make optimal decisions about life insurance.

3.6 Data Collection Procedures

After determining the sample size, the study employed convenience and snowball sampling methods. According to the Ministry of Economy (2023), there were 7,909.1 thousand households in Malaysia in 2022, distributed across states and federal territories. Table 3-1 presents the distribution of sample size based on the number of households by state and federal territories in 2022.

Table 3-1:
Distribution of Sample Size

States/ Federal Territories	Number of Households ('000)	Distribution of Sample Size
Johor	999.4	25
Kedah	534.2	14
Kelantan	357.8	9
Melaka	262.0	7
Negeri Sembilan	309.3	8
Pahang	382.6	10
Pulau Pinang	478.3	12
Perak	649.9	16
Perlis	75.8	2
Selangor	1774.8	45
Terengganu	281.4	7
Sabah	601.3	15
Sarawak	596.8	15
Federal Territories	605.5	15
Total	7909.1	200

After discussing the distribution of sample size, the researcher disseminated the survey through social media platforms. Social media platforms, including Facebook, Instagram, and WhatsApp were primarily used to reach target respondents. On Facebook, the researcher shared the survey link on her personal profile page and several Malaysian-based groups such as Survey Exchange, Survey and Questionnaire Malaysia, Survey Exchange Sarawak, and many other groups. Posting the survey on the researcher's profile and relevant groups encouraged voluntary participation. Then, the researcher also sent private messages to group members, inviting them to participate in the survey if they had not completed it when it was initially posted. Additionally, participants who had already completed the survey were encouraged to refer others who met the study's criteria. Aside from Facebook, the survey link was also shared on Instagram, inviting respondents to participate based on the study's eligibility requirements. The researcher also used WhatsApp

to send the survey link to friends, relatives, and acquaintances, further expanding the respondent pool.

3.7 Pilot Study

A pilot study is defined as a small-scale study to assess research protocols, data-gathering approaches, participant selection processes, and other research procedures in preparation for a larger study (Hassan et al., 2006; Teresi et al., 2022). The pilot study is also a necessary stage in the research process, aiming to determine possible problem areas and shortcomings in the research instruments and protocols before initiating the full-scale study. The pilot study can also aid research team members in becoming more familiar with the protocol procedures.

Several literatures suggested that the required sample size for a pilot study may differ, such as 10-25 (Sheatsley, 1983), 20-40 (Kieser & Wassmer, 1996), 20-50 (Sudman, 1976), ≥ 55 (Sim & Lewis, 2012), and so on. Ultimately, the researcher determined the sample size based on the available time and allocated budget for the pilot test.

In this study, the researcher conducted a pilot study involving 54 randomly selected respondents from the target population to assess the reliability and validity of the proposed questionnaire and to detect any potential issues with it. Four respondents were excluded from the study due to being foreigners and not purchasing life insurance, leaving a total of 50 respondents. The higher the Cronbach's alpha, α , the more reliable the generated scale is (Barbera et al., 2020). An α value of 0.7 or higher is generally regarded as an acceptable level of reliability.

Table 3-2:
Reliability Test for Pilot Study

Variables	No. of Items	Cronbach's Alpha
Attitude towards life insurance	6	0.828
Subjective norm	6	0.814
Perceived behavioural control	6	0.825
Financial literacy	6	0.811
Perceived risk	6	0.856
Intention to make optimal decisions for purchasing life insurance	6	0.932
Hyperbolic discounting	6	0.847

According to Table 3-2, the values of Cronbach's alpha for the variables in this pilot study range from 0.811 to 0.932, all exceeding the acceptable threshold of 0.7, indicating a very good level of reliability using SPSS version 22. No complaints or negative feedback were received from the pilot respondents, confirming that the items of the questionnaire were clear, relevant, and easy to understand. Additionally, no major revisions were needed, as no issues related to wording, formatting, or flow were identified. With no errors detected during the pilot study, the questionnaire items were considered both valid and reliable. Thus, the researcher proceeded with the full data collection across Malaysia to analyse the data.

3.8 Construction of Questionnaire

The online survey consists of two sections, Section A and Section B, and respondents are required to complete both sections as mandatory (Refer to Appendix A). The survey includes closed-ended questions, offering respondents a set of predetermined answers to choose from. This format facilitates efficient data coding, enabling quicker preparation for subsequent data analysis. To create this questionnaire, all questions are adapted from previous literature and modified to fit this research topic.

- **Section A** is demographic information, including states and federal territories, gender, age, race, marital status, number of children in the household, highest education level, employment status, individual monthly income, and number of life insurance policies. The type of life insurance policies bought is also included to identify the participants' insurance experience and understand which products are most commonly purchased. Besides, mistakes made (suboptimal decisions made) are included to determine whether participants have made suboptimal decisions in their insurance decisions, providing insight into decision quality. Lastly, types of mistakes made (types of suboptimal decisions made) are included in this study to identify which types of suboptimal decisions the participants commonly commit.
- **Section B** is designed to measure the independent variables (ATT, SN, PBC, FL, PR), mediating variable (INT), moderating variable (HD), and dependent variable (OD).

Since this study is quantitative, employing a Likert scale enables faster data processing and statistical analysis, allowing the researcher to conclude efficiently based on participants' responses. The Likert scale is a widely used rating system that enables respondents to show their level of agreement with a statement, typically ranging from “strongly disagree” to “strongly agree” (Hutchinson, 2021). According to Taherdoost (2019), shorter scales, such as a five-point Likert scale, can reduce respondents' cognitive load and frustration, increasing their willingness to participate and provide thoughtful responses. Therefore, the items in this questionnaire were assessed using a five-point Likert scale, ranging from “strongly disagree” to “strongly agree”, as shown in Table 3-3.

3.9 Description of Variables

TPB was employed in this study as the foundational theory to better understand optimal decisions of life insurance purchasing behaviour. According to TPB, the intention to make optimal decisions for purchasing life insurance is the most immediate determinant of actual optimal decisions of life insurance purchasing behaviour, which is influenced by attitude towards life insurance, subjective norms, and perceived behavioural control. In this framework, intention functions as a mediator to bridge the influences of both traditional TPB constructs and extended antecedents (financial risk and perceived risk) on actual optimal decisions of life insurance purchasing behaviour. When FL and PR are incorporated, intention further explains how individuals' understanding of financial concepts (Pitthan & De Witte, 2021) and their evaluation of potential risks (Khasbulloh & Suparna, 2022) shape their motivation to make optimal decisions regarding life insurance. Thus, stronger intention enhances the conversion of higher financial literacy, lower perceived risk, and favourable TPB constructs (attitude, subjective norm, and perceived behavioural control) into optimal decisions of life insurance purchasing behaviour, indicating that intention plays a crucial mediating role in the model.

Hyperbolic discounting, which is one of the behavioural economics concepts describing the preference for immediate gratification over future benefits (Zielonka & Szymanek, 2023), is introduced as a moderating variable between intention to make optimal decisions for purchasing life insurance and actual optimal decisions of life insurance purchasing behaviour, as even when strong intentions are formed, present-bias may weaken the translation of intention into actual optimal decisions. Even if the consumers have

favourable TPB constructs, high financial literacy, or low perceived risk, they may still fail to make optimal life insurance purchasing decisions because the moderating effect of hyperbolic discounting disrupts the intention-behaviour link. Conversely, individuals with lower levels of present bias are more likely to act in line with their intentions, effectively converting favourable TPB constructs, sound financial understanding, and balanced risk perceptions into optimal decisions. Collectively, the model synthesises TPB with financial literacy, perceived risk, and hyperbolic discounting to provide a theoretically grounded and holistic explanation of the determinants of optimal decisions of life insurance purchasing behaviour.

3.9.1 Independent Variables

3.9.1.1 *Attitude towards Life Insurance (ATT)*

ATT is an individual's beliefs and feelings toward making optimal decisions about life insurance. "ATT1: Life insurance policy in my opinion prevents potential financial burden." and "ATT2: Choosing the best life insurance in my opinion protects my loved one" were applied in this study as they emphasise the cognitive evaluation of life insurance's value, reflecting respondents' perception of life insurance as a tool to mitigate financial burden and safeguard loved ones. Secondly, "ATT3: I feel making optimal decisions regarding life insurance is really good for me." and "ATT4: I feel connected to a community of buyers who value life insurance policies." were selected because they reflect the affective components of attitude, showing the positive emotional response associated with making optimal decisions and the sense of belonging to a community that values life insurance. Lastly, "ATT5: I am motivated to make the best decisions regarding life insurance." and "ATT6: I am determined to make the best decisions regarding life insurance." were applied as these items reflect the conative component of attitude, representing motivation and determination to make optimal decisions towards life insurance. The original questions were adapted from Md et al. (2017); Nomi and Sabbir (2020); Alfiero et al. (2022); Baggio and Kumar (2023), as shown in Table 3-3.

3.9.1.2 *Subjective Norm (SN)*

SN is the social pressures or expectations individuals perceive from significant others (such as family and friends) that influence their optimal decisions of life insurance purchasing behaviour. "SN1: My family's opinion of what I should do is important to me.",

“SN2: My friends think that I should make the best decisions regarding life insurance.”, and “SN3: People I care about will remind me to buy the best life insurance policy to accumulate wealth.” were utilised in this study as they reflect normative beliefs, showing how family, friends, and significant others influence the respondents’ optimal decisions of life insurance purchasing behaviour. Besides, “SN4: I am motivated to accept social expectations in selecting the best life insurance policy.”, “SN5: I follow the opinions of family members.”, and “SN6: I follow the opinions of friends.” were used in this study as they indicate motivation to comply, highlighting consumers’ tendency to follow these social expectations when making optimal decisions regarding life insurance. The original questions were adapted from Karash (2008); Ogutu et al. (2014); Giri (2018); Horne et al. (2020); Phuong et al. (2024), as presented in Table 3-3.

3.9.1.3 Perceived Behavioural Control (PBC)

PBC is an individual’s confidence and sense of control in making optimal decisions about life insurance policies. “PBC1: I have enough sources of information for reference in life insurance policies.”, “PBC2: I understand what life insurance is.” and “PBC3: I have confidence in selecting the right life insurance policy that meets my needs.” were applied in this study as they indicate perceived self-efficacy, reflecting individuals’ knowledge, understanding, and confidence in their ability to evaluate options and make optimal decisions regarding life insurance. Besides, “PBC4: I am in full control of what I do.”, “PBC5: I am completely responsible for everything that results from my decisions.” and “PBC6: I make decisions from the very beginning to the very end.” were applied in this study as they represent perceived controllability, which reflects individuals’ sense of autonomy, authority, and responsibility in managing the entire decision-making process for life insurance. The original questions were adapted from Tsai (2010); Ogutu et al. (2014); Mamun et al. (2021); Botha and Wiese (2024), as shown in Table 3-3.

3.9.1.4 Financial Literacy (FL)

FL is an individual’s understanding of financial concepts that guide optimal decisions in life insurance to achieve long-term financial goals. Firstly, “FL1: An investment-linked life insurance with a high return rate will have a high-risk rate.” and “FL2: When the inflation rate increases, the cost-of-living increases.” were applied in this study as they assess basic financial knowledge, reflecting participants’ understanding of fundamental concepts such as the relationship between risk and return, and the impact of inflation on the cost of living,

which are essential for life insurance decision-making. Besides, “FL3: I have a strong belief that the way that I manage my life insurance will affect my future.” and “FL4: It is essential to set financial goals for the future.” were employed in this study as they reflect the role of financial planning, emphasising how managing life insurance and setting clear financial goals contribute to long-term financial security and optimal decision-making. Moreover, “FL5: I compare the prices of life insurance policies.” and “FL6: I always reach the goals I set when managing my life insurance policy.” were utilised in this study as they reflect practical financial behaviours, indicating individuals’ habits of comparing policy prices and achieving set goals, which contribute to informed and optimal decision-making. The original questions were adapted from Danes and Haberman (2007); Lin et al. (2017); Weerasekara et al. (2018); Vieira et al. (2020); Lontchi et al. (2022), as displayed in Table 3-3.

3.9.1.5 Perceived Risk (PR)

PR is an individual’s negative feelings about the potential negative outcomes of not making an optimal decision when purchasing a life insurance policy. Firstly, “PR1: I fear that the life insurance policy I purchased will not meet my expectations.” and “PR2: I fear that the life insurance policy I purchased may not provide benefits.” were used in this study as they indicate performance risk, reflecting concerns about whether the policy will deliver the expected performance and value. Secondly, “PR3: I worry that the life insurance policy I purchased is not worth the money spent.” and “PR4: I do not think spending money on life insurance is wise.” were applied as they indicate financial risk, showing negative feelings associated with the possibility of financial loss from the investment. Lastly, “PR5: I feel worried whether my decision regarding life insurance is the right one.” and “PR6: I feel anxious when buying a life insurance policy.” were employed in this study as these items represent psychological risk, showing emotional discomfort, anxiety, and uncertainty associated with life insurance decision-making. The original questions were adapted from Im et al. (2008); Wu and Chen (2014); Sánchez-Alzate and Sánchez-Torres (2017); Sin (2018); Kim and Jeong (2024), as depicted in Table 3-3.

3.9.2 Mediating Variable

Intention to make optimal decisions for purchasing life insurance is an individual’s plan and commitment to make optimal decisions about purchasing life insurance. “INT1: I intend to gather as much information as possible to make the best decisions for life insurance.”

and “INT2: I plan to consider the pros and cons of a life insurance policy, aiming for the optimal decisions.” were employed in this study as they reflect the cognitive preparation to collect and evaluate information before making optimal decisions. Besides, “INT3: I intend to invest my time in making the best decisions for life insurance.” and “INT4: I intend to understand which insurance products suit me best.” were applied in this study as they indicate the intention to dedicate time and effort to ensure personalised and well-informed decision-making. Lastly, “INT5: I plan to make the best decisions regarding life insurance to avoid financial burdens.” and “INT6: I intend to buy the best life insurance policy in the future.” were utilised in this study as they focus on proactive planning and commitment to translate intentions into future optimal decisions of life insurance purchasing behaviour. The original questions were adapted from Piquart et al. (2004); Hong et al. (2016); Nomi and Sabbir (2020); Chung (2021), as shown in Table 3-3.

3.9.3 Moderating Variable

Hyperbolic discounting is the preference for immediate rewards over larger future benefits when making optimal decisions about life insurance policies. Firstly, “HD1: I would choose to receive an immediate prize of RM100 rather than waiting for RM200 two years from now.”, “HD2: It makes more sense to spend my money now rather than making optimal decisions towards life insurance purchases for the future.”, “HD3: Individuals should have time to enjoy themselves today.”, and “HD4: I prefer immediate rewards over rewards that come later in the future although the immediate reward is smaller.” were used in this study as they indicate the preference for immediate rewards, reflecting a tendency to prioritise instant gratification and undervalue future benefits. Besides, “HD5: I often exhibit hesitation when considering long-term life insurance products.” and “HD6: I prefer short-term products compared to long-term life insurance products.” were employed in this study as these items indicate short-term orientation in financial decisions, showing inclination towards short-term spending and hesitation towards long-term financial commitments. The original questions were adapted from Sopher and Sheth (2006); Da Silva et al. (2017); Ericson and Laibson (2019); Zhang et al. (2021), as listed in Table 3-3.

3.9.4 Dependent Variable

Optimal decisions of life insurance purchasing behaviour are the process of evaluating and purchasing the best life insurance policy. In this study, the best life insurance is defined as a policy that offers adequate coverage, aligns with the policyholder's specific needs by selecting the right type of policy, minimises misinterpretation of insurance terms, and includes suitable riders to ensure comprehensive protection. “OD1: I have already gathered as much information as possible to make the best choice for life insurance.” and “OD2: I made the optimal decisions after weighing the pros and cons of life insurance policies.” were employed in this study as they reflect the cognitive evaluation, indicating effort to gather and process relevant information for optimal decisions of life insurance purchasing behaviour. Besides, “OD3: I spent my time making optimal decisions for life insurance purchases.” and “OD4: I understood which insurance products suit me best.” were applied in this study as they indicate effort and personalisation, capturing the individual’s investment of time and effort to achieve personal optimal outcomes of life insurance purchasing behaviour. Lastly, “OD5: I made optimal decisions for life insurance purchases to avoid financial burdens.” and “OD6: I bought the best life insurance policy.” were employed in this study as they emphasise outcome orientation, achieving the best possible outcome and mitigating future financial risks. The original questions were adapted from Pinquart et al. (2004); Hong et al. (2016); Nomi and Sabbir (2020); Chung (2021) as depicted in Table 3-3. According to Fishbein and Ajzen (1975), the immediate antecedent of actual behaviour is intention, implying that intention should effectively predict behaviour. Thus, the measurement of OD should be similar to that of INT.

**Table 3-3:
Description of Variables**

Constructs	Definitions	Dimensions	Indicators/Items	Sources	Scaling
Attitude towards life insurance	ATT is an individual’s beliefs and feelings toward making optimal decisions about life insurance.	Cognitive	ATT1: Life insurance policy in my opinion prevents potential financial burden. ATT2: Choosing the best life insurance in my opinion protects my loved one.	Adapted from Md et al. (2017); Nomi and Sabbir (2020); Alfiero et al. (2022); Baggio and Kumar (2023)	Likert scale: Strongly disagree (1); Disagree (2); Neutral (3); Agree (4); Strongly agree (5)
		Affective	ATT3: I feel making optimal decisions regarding life insurance is really good for me. ATT4: I feel connected to a community of buyers who value life insurance policies.		
		Conative	ATT5: I am motivated to make the best decisions regarding life insurance.		

ATT6: I am determined to make the best decisions regarding life insurance.					
Subjective norm	SN is the social pressures or expectations individuals perceive from significant others (such as family and friends) that influence their optimal decisions of life insurance purchasing behaviour.	Normative belief Motivation to comply	SN1: My family's opinion of what I should do is important to me. SN2: My friends think that I should make the best decisions regarding life insurance. SN3: People I care about will remind me to buy the best life insurance policy to accumulate wealth. SN4: I am motivated to accept social expectations in selecting the best life insurance policy. SN5: I follow the opinions of family members. SN6: I follow the opinions of friends.	Adapted from Karash (2008); Ogutu et al. (2014); Giri (2018); Horne et al. (2020); Phuong et al. (2024)	Likert scale: Strongly disagree (1); Disagree (2); Neutral (3); Agree (4); Strongly agree (5)
Perceived behavioural control	PBC is an individual's confidence and sense of control in making optimal decisions about life insurance policies.	Perceived self-efficacy Perceived controllability	PBC1: I have enough sources of information for reference in life insurance policies. PBC2: I understand what life insurance is. PBC3: I have confidence in selecting the right life insurance policy that meets my needs. PBC4: I am in full control of what I do. PBC5: I am completely responsible for everything that results from my decisions. PBC6: I make decisions from the very beginning to the very end.	Adapted from Tsai (2010); Ogutu et al. (2014); Mamun et al. (2021); Botha and Wiese (2024)	Likert scale: Strongly disagree (1); Disagree (2); Neutral (3); Agree (4); Strongly agree (5)
Financial literacy	FL is an individual's understanding of financial concepts that guide optimal decisions in life insurance to achieve long-term financial goals.	Financial knowledge Financial planning Practical financial behaviour	FL1: An investment-linked life insurance with a high return rate will have a high-risk rate. FL2: When the inflation rate increases, the cost-of-living increases. FL3: I have a strong belief that the way that I manage my life insurance will affect my future. FL4: It is essential to set financial goals for the future. FL5: I compare the prices of life insurance policies. FL6: I always reach the goals I set when managing my life insurance policy.	Adapted from Danes and Haberman (2007); Lin et al. (2017); Weerasekara et al. (2018); Vieira et al. (2020); Lontchi et al. (2022)	Likert scale: Strongly disagree (1); Disagree (2); Neutral (3); Agree (4); Strongly agree (5)
Perceived risk	PR is an individual's negative feelings about the potential negative outcomes of not making an	Performance risk	PR1: I fear that the life insurance policy I purchased will not meet my expectations. PR2: I fear that the life insurance policy I purchased may not provide benefits.	Adapted from Im et al. (2008); Wu and Chen (2014); Sánchez-	Likert scale: Strongly disagree (1); Disagree (2);

	optimal decision when purchasing a life insurance policy.	Financial risk	PR3: I worry that the life insurance policy I purchased is not worth the money spent. PR4: I do not think spending money on life insurance is wise. PR5: I feel worried whether my decision regarding life insurance is the right one. PR6: I feel anxious when buying a life insurance policy.	Alzate and Sánchez-Torres (2017); Sin (2018); Kim and Jeong (2024)	Neutral (3); Agree (4); Strongly agree (5)
		Psychological risk			
Intention to make optimal decisions for purchasing life insurance	INT is an individual's plan and commitment to make optimal decisions about purchasing life insurance.	Cognitive preparation	INT1: I intend to gather as much information as possible to make the best decisions for life insurance. INT2: I plan to consider the pros and cons of a life insurance policy, aiming for the optimal decisions. INT3: I intend to invest my time in making the best decisions for life insurance. INT4: I intend to understand which insurance products suit me best. INT5: I plan to make the best decisions regarding life insurance to avoid financial burdens. INT6: I intend to buy the best life insurance policy in the future.	Adapted from Piquart et al. (2004); Hong et al. (2016); Nomi and Sabbir (2020); Chung (2021)	Likert scale: Strongly disagree (1); Disagree (2); Neutral (3); Agree (4); Strongly agree (5)
		Effort and personalisation			
		Planning and commitment			
Hyperbolic discounting	HD is the preference for immediate rewards over larger future benefits when making optimal decisions about life insurance policies.	Preference of immediate rewards	HD1: I would choose to receive an immediate prize of RM100 rather than waiting for RM200 two years from now. HD2: It makes more sense to spend my money now rather than making optimal decisions towards life insurance purchases for the future. HD3: Individuals should have time to enjoy themselves today. HD4: I prefer immediate rewards over rewards that come later in the future although the immediate reward is smaller. HD5: I often exhibit hesitation when considering long-term life insurance products. HD6: I prefer short-term products compared to long-term life insurance products.	Adapted from Sopher and Sheth (2006); Da Silva et al. (2017); Ericson and Laibson (2019); Zhang et al. (2021)	Likert scale: Strongly disagree (1); Disagree (2); Neutral (3); Agree (4); Strongly agree (5)
		Short-term orientation			
Optimal decisions of life insurance purchasing behaviour	OD is the process of evaluating and purchasing the best life insurance policy. In this study, the best life insurance is defined as a	Cognitive evaluation	OD1: I have already gathered as much information as possible to make the best choice for life insurance. OD2: I made the optimal decisions after weighing the pros and cons of life insurance policies.	Adapted from Piquart et al. (2004); Hong et al. (2016); Nomi and Sabbir	Likert scale: Strongly disagree (1); Disagree (2); Neutral

policy that offers adequate coverage, aligns with the policyholder's specific needs by selecting the right type of policy, minimises misinterpretation of insurance terms, and includes suitable riders to ensure comprehensive protection.	Effort and personalisation	OD3: I spent my time making optimal decisions for life insurance purchases. OD4: I understood which insurance products suit me best. OD5: I made optimal decisions for life insurance purchases to avoid financial burdens. OD6: I bought the best life insurance policy.	(2020); Chung (2021)	(3); Agree (4); Strongly agree (5)
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3.10 Data Analysis

After collecting data, data analysis was performed, including data preparation, assumption testing, non-response bias check, common method variance, descriptive statistics, and the analyses of both measurement and structural models to confirm the hypotheses developed in this study. Besides, mediation and moderation analyses were also performed using SmartPLS software.

3.10.1 Data Preparation

Data preparation, including the detection of straight lining, missing values, and outliers, was conducted after data collection. This study used closed-ended questions with 13 demographic items, 30 items for independent variables, 6 items each for mediating and moderating variables, and 6 items for the dependent variable. A coding process was also performed, with all variables pre-coded on a 1-5 scale, where 1 represents “strongly disagree” and 5 “strongly agree”.

3.10.1.1 Missing Values

The online questionnaire was distributed to respondents via Google Forms, with each section set as compulsory. Since respondents were required to answer every question, all questionnaires were fully completed, eliminating the possibility of missing values.

3.10.1.2 Straight Lining

This study also detected straight lining when the respondents consistently give identical or similar answers to most questions, potentially affecting data quality (Kim et al., 2019). The identification of straight lining was conducted in Microsoft Excel by calculating the standard deviation of responses across variables. Respondents with a standard deviation of zero are identified as straightliners (Biggi et al., 2024).

3.10.1.3 Outliers

Outliers, which are values that significantly deviate from the remaining data, can occur in any statistical data due to the collection of many variables (Walfish, 2006; Dash et al., 2023). If outliers are non-randomly distributed, they can disrupt normality, increase error variance, and weaken the power of statistical tests. In this study, Mahalanobis distance measure was used to detect outliers with the help of SPSS version 22. Mahalanobis distance is a metric used to measure the distance between a data point and the centroid of a distribution, especially in multivariate data. It accounts for how many standard deviations the point is from the centroid, making it an effective method for identifying outliers (Dashdondov & Kim, 2023). A higher Mahalanobis D^2 value indicates that a data point is farther from the centroid of the distribution, suggesting that it may be an outlier (Grentzelos et al., 2021).

3.10.2 Assumption Testing

After data preparation, assumption testing was carried out to ensure the statistical methods were appropriate and to enhance the reliability of the findings (Verma & Abdel-Salam, 2019).

3.10.2.1 Normality Test

Assessing the normality of data is essential since it serves as a fundamental assumption for numerous parametric statistical tests, ensuring the validity and reliability of the results (Mishra et al., 2019). This study applied Mardia's skewness and kurtosis to assess normality because they were considered the most stable and reliable measures (Wulandari et al., 2021). Online software developed by Cain et al. (2017) for calculating Mardia's skewness and kurtosis, was utilised in this study. For skewness, a sample follows a multivariate normal distribution if its statistic value is below the critical threshold. For

kurtosis, a sample is considered normally distributed if the statistic value falls within the range of the lower and upper critical values.

3.10.2.2 Normality of Error Terms

The normality of the error terms in this study was assessed using SPSS software through the normal P-P plot. If the points align closely with the diagonal line, it suggests that the error terms follow a normal distribution.

3.10.2.3 Homoscedasticity

Homoscedasticity refers to the variance of the errors being constant across all levels of the dependent variable, which is different from heteroscedasticity (not constant) (Jamshidian & Jalal, 2010; Alabi et al., 2020). The simplest way to evaluate homoscedasticity is by analysing the constant pattern in a scatterplot, where the predicted values (ZPRED) are plotted on the x-axis and the residual values (ZRESID) on the y-axis. The Breusch-Pagan test was also used in this study to test heteroscedasticity. If the p-value ≥ 0.05 , indicating that the variance of error terms is constant (homoscedasticity), and there is no problem with heteroscedasticity (Ilori & Tanimowo, 2022).

3.10.2.4 Autocorrelation

Autocorrelation is a key assumption in multivariate analysis, which states that errors should not be correlated with each other. The Durbin-Watson test was the most widely used method for detecting autocorrelation (King, 1981; Kabaila et al., 2021). A Durbin-Watson test statistic between 1.5 and 2.5 is generally considered acceptable.

3.10.3 Non-Response Bias Check

Non-response bias can occur when participants who do not respond or respond late are systematically different from those who complete the survey (Lahaut et al., 2002; Zahl-Thanem et al., 2021). This study employed an independent samples t-test to assess non-response bias by comparing 85 early respondents with 85 late respondents from the sample.

The 85 early respondents, randomly selected, were assumed to have completed the survey voluntarily, while the 85 late respondents were selected and regarded as those who needed reminders or prompts to complete it. If the p-value is greater than 0.05, the analysis

would reveal no significant differences in the means among respondents. Additionally, if the p-value is greater than 0.05, the results would indicate no significant differences in the assumption of equal variances between early and late respondents, suggesting that non-response bias is not a concern.

3.10.4 Common Method Variance (CMV)

Common method variance (CMV), particularly single-source bias, can threaten the reliability and validity of the study items, potentially leading to flawed or skewed results (Garger et al., 2019). In this study, a full collinearity test was conducted using WarpPLS software. According to Kock (2015a), the constructs can be considered free from common method bias if all variance inflation factors (VIFs) from a full collinearity test are equal to or lower than 3.3.

3.10.5 Descriptive Statistics

Descriptive statistics help the researchers to elaborate or summarise basic features of the collected demographic data of the households in this study. Demographic information such as states and federal territories, gender, age, race, marital status, number of children in the household, highest education level, employment status, individual monthly income, number of life insurance policies, types of life insurance policies bought, the mistakes made in life insurance decision (less optimal decisions), and types of mistakes made, were analysed in term of frequency (*f*) and percentage (%) to present the results of the collected data. Additionally, this study performed descriptive analyses of the constructs, reporting the mean, standard deviation, as well as minimum and maximum values for each construct.

3.10.6 Structural Equation Modelling (SEM)

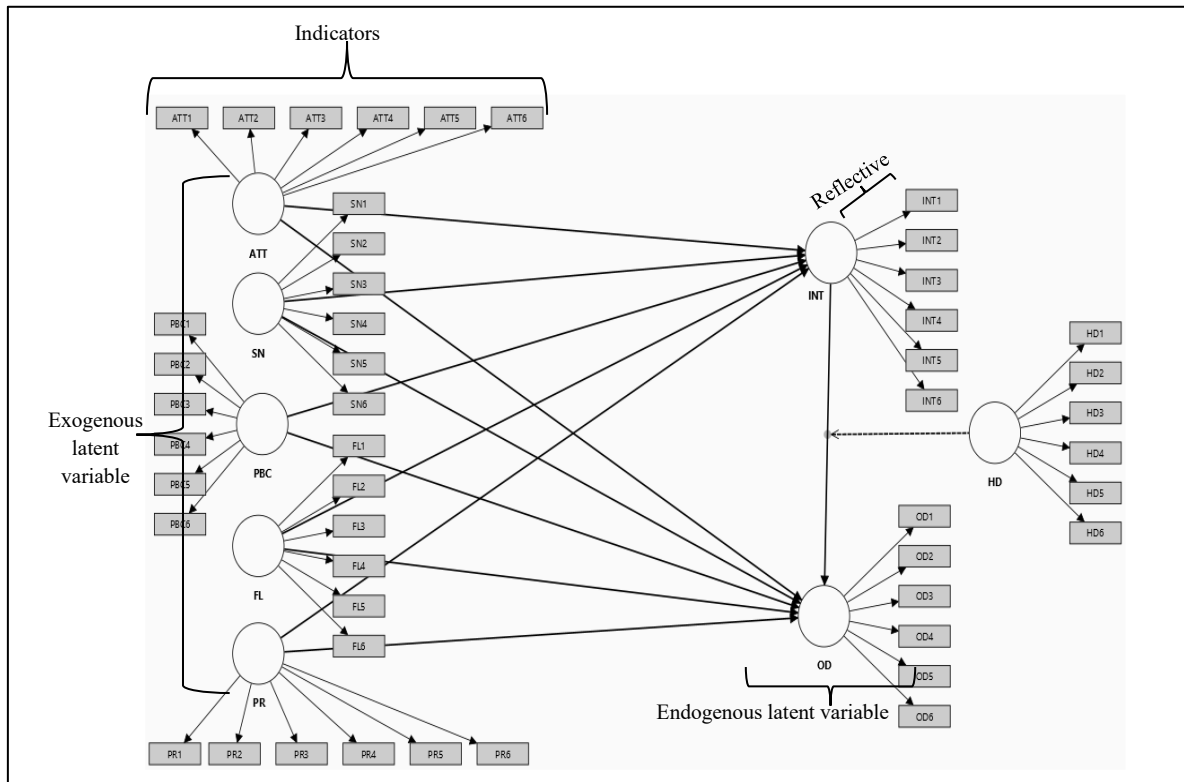
Structural equation modelling (SEM) as a family of statistical tools has gained significant popularity in the fields of social sciences and business to test theoretical frameworks (Shaheen et al., 2017; Kline, 2023). SEM is a strong and multivariate statistical tool applied in scientific investigations to investigate and evaluate multivariate causal relationships (Fan et al., 2016). SEM was applied in this study using SmartPLS 4 as it can test the direct and indirect effects on pre-assumed causal relationships. The capability of SEM to assess complex models with multiple constructs and their indicators has allowed

researchers to examine relationships that previously could not be studied (Astrachan et al., 2014).

Although the initial application of SEM follows a covariance-based approach (CB-SEM), the researchers also have the alternative of choosing the variance-based SEM approach (PLS-SEM) (Hair & Alamer, 2022). Hair Jr et al. (2021) also stated that CB-SEM is used to validate and reject theories by determining how well a model can predict the covariance matrix whereas PLS-SEM applies ordinary least squares (OLS) regression to formulate theory by concerning on explaining the variance in the dependent variables, estimating path coefficients, and maximising R^2 values of the endogenous construct. PLS-SEM is the preferred method if the study lacks a strong theoretical foundation, particularly when limited prior knowledge exists on the causal relationship. PLS-SEM does not require a large sample size as it is developed based on the properties of OLS and can rely on the minimum sample size requirement of 200 (Dash & Paul, 2021). Since PLS-SEM is a non-parametric technique, it does not require a normal data distribution (Ravand & Baghaei, 2019). For PLS-SEM, most missing data techniques (such as pairwise deletion, mean replacement, casewise deletion) can be used if the missing value per indicator is less than 5%. Thus, PLS-SEM was applied in this study due to the skewed distribution of data.

PLS-SEM consists of two main models, which are measurement models and structural models. In PLS-SEM, the term construct refers to a variable that is not directly measured by indicators and is known as a latent variable (Richter et al., 2016). The measurement model in SEM was applied in this study to assess the validity and reliability of construct measurements, whereas the structural model was utilised to test hypotheses for the relationships among constructs. In the structural model, the arrangement and positioning of the constructs are determined by the theory established by the researchers. The variables located on the left side are indicated as predictors for the variable on the right side. Latent variables serving as independent variables are known as exogenous latent variables, while those act as dependent variables are called endogenous latent variables (Hadri & Iaousse, 2022). Additionally, a reflective model is characterised by the causal arrows pointing from the latent variable to its measured indicators, whereas a formative model is defined by arrows flowing from the measured indicators to the latent variable. Figure 3-2 shows the proposed SEM model in this study.

Figure 3-2:
The Proposed Reflective Model



3.10.6.1 Measurement Model

This study involved eight constructs, which were conceptualised as reflective rather than formative. These constructs include ATT, SN, PBC, FL, PR, INT, HD, and OD. All constructs in the research model were multi-item and were regarded as reflective. The purpose of employing reflective constructs in this study was to ensure that the measures are correlated with each other and exhibit strong internal consistency, which is vital for maintaining the reliability and validity of the assessed constructs (Hair Jr et al., 2021).

a. Internal Consistency Reliability

Internal consistency reliability was used in this study to assess how consistently the items in a questionnaire measure the intended constructs. Reliability analysis helps researchers estimate errors in the measurement and minimise errors occurring in the study. There are two criteria to assess internal consistency reliability, which are Cronbach's alpha, α (indicating the lower bound or resulting in a lower reliability value) and composite reliability (showing the upper bound or higher reliability value). Cronbach's alpha has been extensively used in research as a conventional method to test the reliability of a construct. The higher the Cronbach's alpha, α , the more reliable the generated scale is (Barbera et al.,

2020). An α value of 0.7 or higher is generally regarded as acceptable for research purposes. The formula of Cronbach's alpha is:

$$\alpha = \left(\frac{n}{n-1}\right)\left(1 - \frac{\sum_{i=1}^n \sigma_{y_i}^2}{\sigma_x^2}\right) \quad \text{Equation 3.1}$$

In this formula, $\sigma_{y_i}^2$ refers to the variance of the indicator variable i of a specific construct, measured with n indicators ($i = 1, \dots, n$), and σ_x^2 represents the variance of the sum of all n indicators of that construct.

However, Cronbach's alpha assumed that all items are equally reliable and have equal outer loadings on the construct (Hair Jr et al., 2021). Thus, composite reliability (CR) was applied in this study to measure internal consistency and consider different outer loadings of the items in the construct. The formula of CR is:

$$CR = \frac{(\sum_{i=1}^n l_i)^2}{(\sum_{i=1}^n l_i)^2 + \sum_{i=1}^n \text{var}(e_i)} \quad \text{Equation 3.2}$$

Where l_i indicates the standardised outer loading of the indicator variable i of a specific construct measured with n indicators, e_i is the measurement error of the indicator variable i , and $\text{var}(e_i)$ stands for the variance of the measurement error, which is defined as $(1 - l_i^2)$. The higher the CR, the higher the level of reliability. According to Hair Jr et al. (2017), a CR value below 0.6 indicates a lack of internal consistency reliability, values of 0.6 to 0.7 are acceptable, and values between 0.7 and 0.9 can be interpreted as satisfactory.

b. Indicator Reliability (Outer Loadings)

In this study, indicator reliability was assessed based on each indicator's loading within a construct, representing the proportion of variance explained by the latent variable. According to Hair Jr et al. (2010), a loading value of ≥ 0.70 demonstrates that the construct explains more than 50% of the indicator's variance, confirming a satisfactory level of reliability. If an indicator's loading falls below this threshold, researchers may consider removing it to improve model reliability.

c. Convergent Validity

Convergent validity refers to the degree to which two measures of the same construct are related or correlated. This means convergent validity evaluates whether two different measurement approaches of the same construct produce similar results. For instance, there

are two different measures to assess job satisfaction: the Job Descriptive Index (JDI) and the Minnesota Satisfaction Questionnaire (MSQ). If the scores on both measures are highly correlated, it indicates that the measures are convergent validity as both measures assess the same construct of job satisfaction and yield similar results.

The average variance extracted (AVE) is the common method to evaluate the convergent validity. According to Hair et al. (2014), AVE refers to the grand mean value of the squared loadings of the indicators related to the constructs (the sum of the squared loadings divided by the number of indicators). Each construct should support at least 50 percent of the assigned indicator's variance ($AVE \geq 0.50$) in order to meet adequate convergent validity (Hair et al., 2017). The formula of AVE is:

$$AVE = \left(\frac{\sum_{i=1}^n l_i^2}{n} \right) \quad \text{Equation 3.3}$$

d. Discriminant Validity

Discriminant validity measures the extent to which indicators differentiate between constructs or measure distinct concepts by analysing the correlations among potentially overlapping measures (Cheung et al., 2024). In other words, it assesses whether the constructs under investigation are truly distinct from one another.

There are three criteria to assess discriminant validity, which are cross-loading criterion, Fornell-Larcker criterion, and Heterotrait-Monotrait ratio of correlations (HTMT). For the cross-loading criterion, the loading of an indicator on its associated constructs should be larger than any of its cross-loading (correlation) on another construct to establish discriminant validity. Additionally, the difference between loadings across latent variables is not less than 0.1. Fornell-Larcker criterion compares the latent variable correlations with the square root of the constructs' AVE. The square roots of AVE for each construct should be larger than its highest correlations with any other construct. Lastly, Heterotrait-monotrait (HTMT) ratio is an estimate of what the true correlation between two constructs would be if they are perfectly reliable. An HTMT value greater than the $HTMT_{0.85}$ value of 0.85 (Kline, 2023) or $HTMT_{0.90}$ value of 0.90 (Gold et al., 2001) indicates that there is an issue of discriminant validity.

3.10.6.2 Structural Model

PLS-SEM estimates parameters with the purpose of maximising the explained variance of the endogenous latent variables. The model is evaluated in terms of how well it predicts the endogenous variables. The basic requirements to evaluate the structural model in PLS-SEM are the collinearity, significance of the path coefficient, the level of R^2 , the f^2 effect size, and the predictive relevance Q^2 .

a. Collinearity Issues

Collinearity, or multicollinearity, occurs when independent variables in a regression model are strongly correlated, making it difficult to estimate their individual effects accurately (Hill & Adkins, 2008; Kyriazos & Poga, 2023). In PLS-SEM, one of the initial steps is to evaluate collinearity, which can be assessed through the Variance Inflation Factor (VIF). A VIF value of 5 or higher (Hair Jr et al., 2017) or a VIF value of 3.3 or higher (Diamantopoulos & Siguaw, 2006) indicates a potential collinearity problem.

b. Significance of Path Coefficient

A path coefficient, β represents the direct influence of a presumed cause on another variable, which is considered its effect. These coefficients are standardised due to their estimation from correlations (while a path regression coefficient remains unstandardised) (Subhaktiyasa, 2024). The standardised path coefficient ranges approximately from -1 to +1. A coefficient closer to +1 indicates a strong positive relationship, which is typically statistically significant. Conversely, a path coefficient closer to 0 usually implies no significant difference from zero. The significance of a path coefficient should be evaluated based on its standard error that can be obtained through bootstrapping. The t -value determines the coefficient's magnitude relative to its standard error, while the p -value determines the significance of the relationship. If the p -value is below the chosen significance threshold, the relationship is statistically significant. In addition to the t values and p values, reporting the bootstrap confidence interval is recommended, as it determines whether a path coefficient significantly deviates from zero. The bootstrap confidence interval is based on standard error derived from bootstrapping and defines the range within which the true population parameter is expected to fall at a given confidence level. If the confidence interval for an estimated path coefficient does not include zero, the hypothesis that the path equals zero is rejected, indicating a significant effect.

c. The Coefficient of Determination (R^2)

The model's predictive accuracy should be assessed using the coefficient of determination (R^2) score. R^2 can also be regarded as the combined effect of exogenous variables on endogenous variable(s), indicating how much variance in the endogenous constructs is explained by all the exogenous constructs linked to it. R^2 value lies between 0 and 1, with a higher value suggesting greater predictive accuracy. According to Cohen (1988), R^2 values of 0.26, 0.13 or 0.02 for an endogenous latent variable are commonly classified as substantial, moderate, or weak levels of predictive accuracy, respectively.

d. The f^2 Effect Size

The predictor constructs' effect size should be evaluated using Cohen's f^2 (Cohen, 1988). The f^2 measures the relative impact of a predictor construct on an endogenous construct, indicating how much one exogenous construct contributes to the explanation of an endogenous construct in terms of R^2 . According to Cohen (1988), f^2 values of 0.02, 0.15, and 0.35 are considered small, medium, and large effect sizes, respectively. The f^2 effect size can be calculated as below:

$$f^2 = \frac{R_{included}^2 - R_{excluded}^2}{1 - R_{included}^2} \quad \text{Equation 3.4}$$

Where $R_{included}^2$ and $R_{excluded}^2$ are the endogenous constructs' R^2 values when a selected exogenous latent variable is included or excluded from the PLS path model.

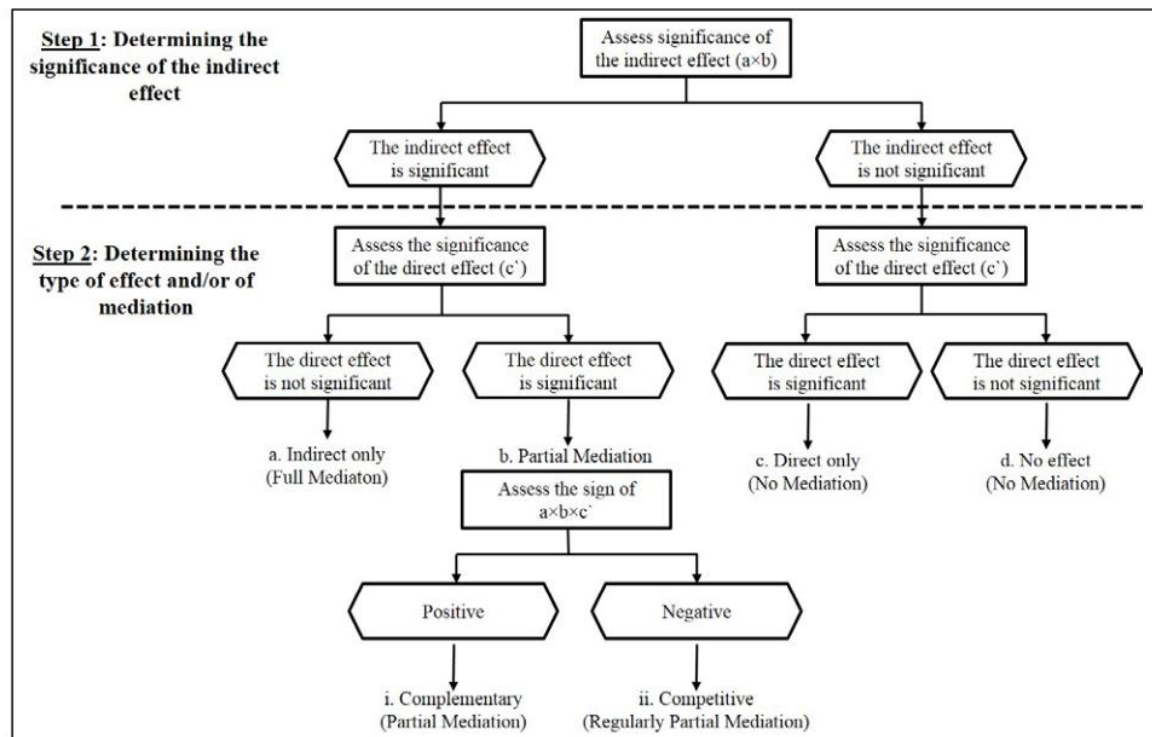
e. The Predictive Relevance (Q^2)

The path model's predictive relevance (Q^2) should be evaluated. Stone and Geisser's Q^2 (Stone, 1974; Geisser, 1974) is widely applied to evaluate predictive relevance and is computed through the blindfolding procedure, which is available in most PLS software packages. The Q^2 value is computed by omitting data points iteratively through a specified omission distance (D). Blindfolding continues until each data point is excluded and the model re-estimated. A Q^2 value above zero for an endogenous latent variable demonstrates that the PLS path model has predictive relevance for that construct. The recommended values for D typically range between 5 and 12.

3.10.7 Mediation Analysis

Mediation occurs when an exogenous construct causes a change in the mediator construct, which leads to a change in the endogenous construct. In this study, INT served as a mediator between the exogenous construct (ATT, SN, PBC, FL, PR) and endogenous construct (OD). Bootstrapping in SEM is commonly used to test the significance of mediating effects, as it provides higher statistical power than traditional methods, such as the Sobel test for indirect effects (Fossum & Montoya, 2023). In mediation analysis, the indirect effect is the product of the regression coefficients for the independent variable on the mediator variable (a path) and the mediator variable on the dependent variable (b path). If the indirect effect ($a \times b$) is significant and direct effect (c') is not significant after monitoring for the mediator variable which is known as full mediation (Zhao et al., 2010). Partial mediation will occur if the indirect effect ($a \times b$) and direct effect (c') are significant, but the magnitude is decreased after controlling the mediator variable. The types of mediation can be determined as displayed in Figure 3-3. Additionally, if 0 does not straddle within the bias-corrected confidence interval of the indirect effect, this indicates that the mediation effect is statistically significant (Preacher & Hayes, 2008; Wang, 2025).

Figure 3-3:
Mediation Analysis Procedure

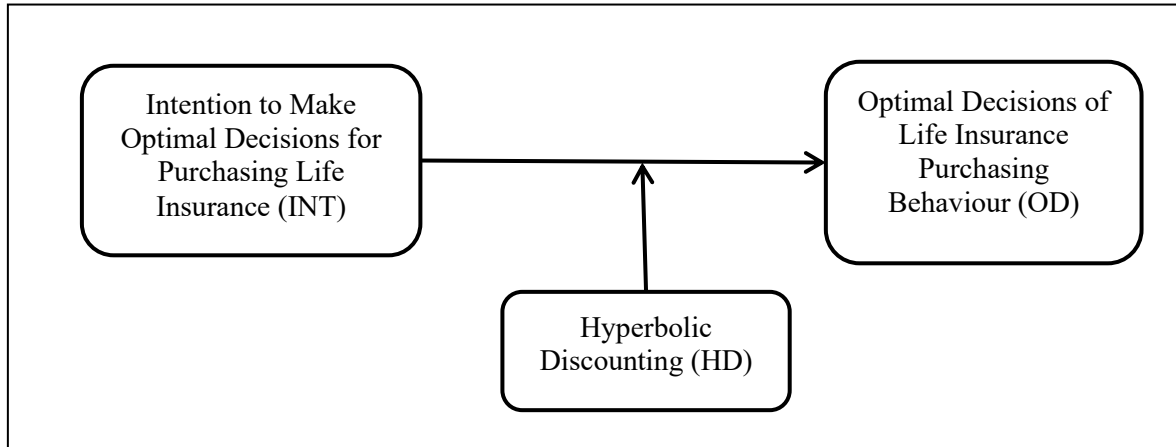


Source: Zhao et al., 2010.

3.10.8 Moderation Analysis

A moderating variable influences the strength of the relationship between the independent and dependent variables (Hair Jr et al., 2017). This study investigated only one moderator, which was hyperbolic discounting (HD) as presented in Figure 3-4. It was proposed that the positive relationship between INT and OD is stronger for lower HD.

**Figure 3-4:
Moderation Relationship**



The initial step in moderation testing is to create the interaction effect between INT and HD. Next, the effect size, f^2 is calculated using the formula below:

$$f^2 = \frac{R^2 \text{ included moderator} - R^2 \text{ excluded moderator}}{1 - R^2 \text{ included moderator}} \quad \text{Equation 3.5}$$

Based on the guidelines provided by Cohen (1988), the values of 0.02, 0.15, and 0.35 display small, medium, and large effect sizes. Then, the bootstrapping procedure was performed to detect whether the interaction effect was significant or not. After determining the significance of the interaction effect, an interaction plot was carried out to visualise whether the effect was stronger, weaker, positive, or negative at different levels of the moderator.

3.11 Ethical Considerations

Ethical considerations are responsible for maintaining public trust, protecting participants' rights and well-being, and ensuring the credibility and validity of research outcomes (Khan, 2024). Before any subjects were enrolled in the survey, informed consent

was given to them for academic purposes. The researcher should ensure that all subjects clearly understood the type of information being collected and the purpose of the study. All subjects were informed that their participation was voluntary and their responses were kept anonymous and confidential. The survey questions were carefully designed to avoid discomfort or distress. Participants were also informed of their right to withdraw from the survey at any point in the study without penalty.

3.12 A Remark

This chapter outlined the methodology employed in the study. This study focused on the research paradigm of positivism with the hypothetico-deductive model of science. A quantitative approach was employed, relying on numerical data to enhance efficiency in terms of resources and time. Data was collected via a cross-sectional online survey consisting of closed-ended questions.

Convenience sampling was applied in this study due to the ease of access to respondents. Additionally, snowball sampling was employed to enhance sample diversity and reduce potential selection bias. After data collection, procedures for data preparation, assumption testing, non-response bias check, and common method variance were elaborated.

PLS-SEM was used for data analysis via SmartPLS software. Both measurement and structural models were examined to assess the reliability and validity of the constructs and to test the study's hypotheses. In addition, moderation and mediation analyses were conducted. Finally, the chapter addressed key ethical considerations relevant to the study.

CHAPTER 4:

FINDINGS AND DISCUSSIONS

4.1 Introduction

Chapter 4 provides a comprehensive statistical evaluation of the studies. Data preparation is conducted before performing the PLS-SEM analysis. This chapter then addresses the assumptions, including multivariate analysis. Next, the demographic characteristics of the respondents and the constructs in this study are summarised using descriptive statistics. Both measurement and structural models are also included. Additionally, moderation and mediation analyses are carried out. A summary is provided at the end of this chapter.

4.2 Data Preparation

In this study, data preparation took place after data collection and before data analysis. During this phase, key decisions were made, including how to address straight lining, missing values, and outliers, whether to apply corrections for statistical and methodological issues, and whether to transform the collected data (Aguinis et al., 2021).

4.2.1 Creating Structure

After collecting the data, the process of structuring started by defining the names of the involving variables. This study employed closed-ended questions, which included thirteen items for demographic characteristics, thirty items for independent variables, six items each for mediating and moderating variables, and six items for the dependent variable.

Then, the coding process was carried out. According to Cohen et al. (2017), coding involves assigning numerical or categorical codes to organise responses into a limited number of classes or categories, facilitating easier statistical analysis and interpretation. In this study, all variables were pre-coded on a 1 to 5 scale, where 1 represents “strongly disagree” and 5 indicates “strongly agree”.

4.2.2 Data Cleaning

In this study, the total number of cases for data collection was 343, with no missing values. Since data collected from various sources might be flawed and could impact the accuracy of the results, data cleaning was performed to ensure that the data was prepared and reliable for analysis (Maharana et al., 2022).

4.2.2.1 Dropout Respondents

In this study, four respondents withdrew from answering the questionnaires, leaving 339 cases.

4.2.2.2 Foreign Respondents

Since the target population consisted of Malaysian respondents, foreign participants were excluded. After removing 3 foreign respondents, a total of 336 cases remained.

4.2.2.3 Straight Lining

This study also examined the response patterns to detect straight lining, a phenomenon where respondents provided identical or nearly identical answers to most questions, thus compromising data quality (Kim et al., 2019). The assessment of straight lining was performed using Microsoft Excel. Straight lining was detected by calculating the standard deviation of responses across variables for each respondent. Respondents with a standard deviation of zero were identified as straightliners. Out of 336 cases, 14 respondents were detected as straightliners and removed, leaving a total of 322 cases to be analysed as shown in Appendix B.

4.2.2.4 Outliers

Table 4-1 reveals 18 cases of outliers in the collected data, identified by Mahalanobis D2 values greater than or equal to 16.8. The stem-and-leaf plots in Appendix C further

confirm that these 18 cases display outlier characteristics and, therefore, should be deleted. After removing 18 outlier cases, 304 cases remained for further analysis.

**Table 4-1:
Multivariate Outlier Detection**

No.	Case Number	Mahalanobis (D^2)
1	25	17.8
2	30	31.3
3	40	26.1
4	54	35.5
5	77	26.3
6	80	21.3
7	82	18.6
8	87	17.9
9	89	18.7
10	96	17.6
11	130	16.8
12	136	32.9
13	145	21.7
14	226	30.4
15	252	21.3
16	272	18.9
17	275	23.4
18	296	24.2

4.3 Assumption Testing

After data preparation, assumption testing was performed in this study. This step is essential to ensure the accuracy and validity of the statistical analyses by confirming that the selected methods are appropriate for the data (Verma & Abdel-Salam, 2019). Verifying these assumptions helps to minimise the risk of bias and strengthen the reliability of the findings.

4.3.1 Normality Test

Assessing the normality of data is essential as it is a key assumption for many parametric statistical tests, ensuring the validity and reliability of the results (Mishra et al., 2019). Mardia's skewness and kurtosis were applied in this study to assess normality because they are considered the most stable and reliable measures (Wulandari et al., 2021). Cain et

al. (2017) also developed online software to calculate Mardia's skewness and kurtosis, which was applied in this study. The normality test results are presented in Table 4-2.

Table 4-2:
Mardia's Multivariate Skewness and Kurtosis

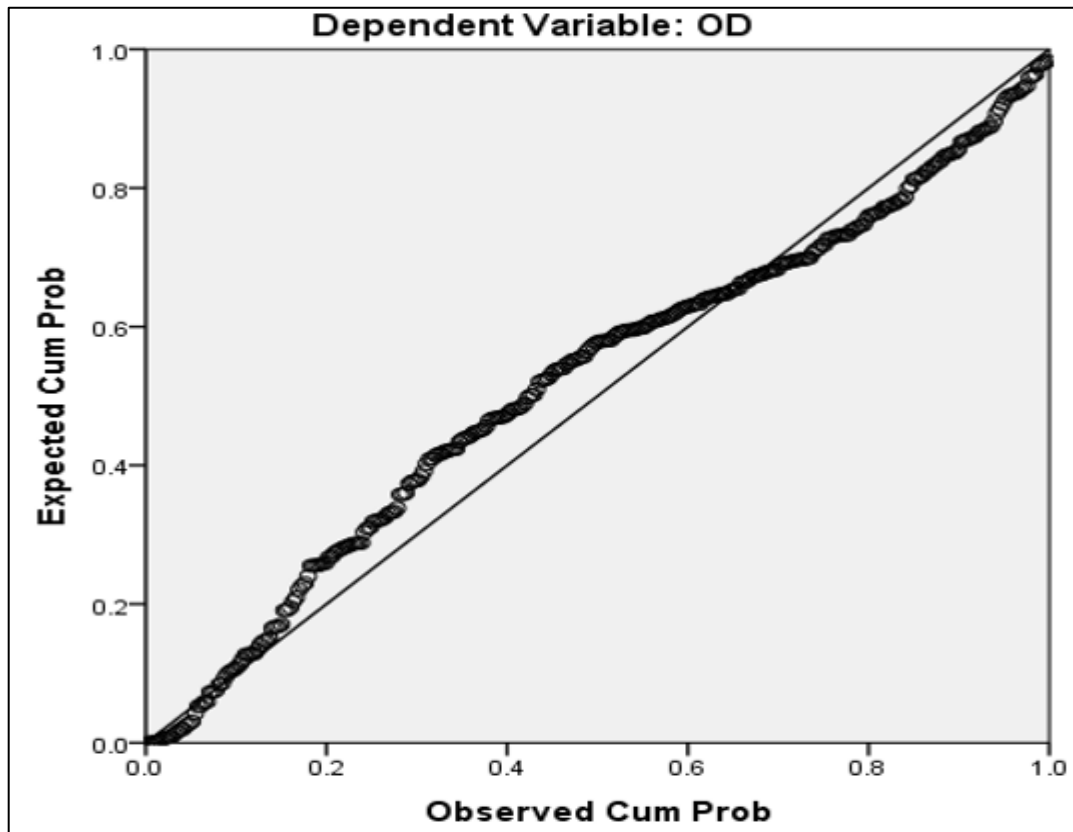
	<i>b</i>	<i>z</i>	<i>p</i> -value
Skewness	8.239332	417.459503	0.00000e ⁺⁰⁰
Kurtosis	90.658721	7.346016	2.04281e ⁻¹³

Based on the result, the value of $b_{1,2} = 8.239332$, and $b_{2,2} = 90.658721$. According to Mardia's (1974) table as shown in Appendix D, the critical values are $b_{1,2,0.05,304} = 0.209$, lower $b_{2,2,0.05,304} = 7.142$, and upper $b_{2,2,0.05,304} = 8.916$. Since the skewness value is greater than 0.209 and the kurtosis value is not within the range [7.142, 8.916], the sample in this study does not follow multivariate normal distribution. Additionally, since the *p*-values for both skewness and kurtosis are less than 0.05, the assumption of normal distribution for the sample is violated. As a result, SmartPLS, a non-parametric analysis tool, was recommended for conducting data analysis.

4.3.2 Normality of Error Terms

The normality of the error terms in this study was assessed using SPSS software through the normal P-P plot. Figure 4-1 below displays that the points are close to the diagonal line, suggesting that the error terms follow a normal distribution.

Figure 4-1:
Normal P-P Plot of Regression Standardised Residual



4.3.3 Homoscedasticity

Homoscedasticity refers to the variance of the errors being constant across all levels of the dependent variable, which is different from heteroscedasticity (not constant) (Jamshidian & Jalal, 2010; Alabi et al., 2020). The simplest way to evaluate homoscedasticity is by analysing the constant pattern in a scatterplot, where the predicted values (ZPRED) are plotted on the x-axis and the residual values (ZRESID) on the y-axis, as shown in Appendix E. The Breusch-Pagan test was also used in this study to test heteroscedasticity. Since the p-value is $0.132 \geq 0.05$, indicating that the heteroscedasticity is not present in the sample, as shown in Appendix E.

4.3.4 Autocorrelation

Autocorrelation is a key assumption in multivariate analysis, which states that errors should not be correlated with each other. The Durbin-Watson test is the most widely used method for detecting autocorrelation (King, 1981; Kabaila et al., 2021). A Durbin-Watson test statistic ranging from 1.5 to 2.5 is generally considered acceptable. In this study, as

shown in Appendix F, the value of Durbin-Watson is 1.789, which falls within the acceptable range, suggesting no autocorrelation in the model.

4.4 Non-Response Bias Check

Non-response bias can occur when participants who do not respond or respond late are systematically different from those who complete the survey (Lahaut et al., 2002; Zahl-Thanem et al., 2021). In this study, an independent samples t-test was employed to assess non-response bias. According to Appendix G, the analysis reveals no significant differences in means among the respondents, with p-values greater than 0.05. Additionally, the results show no significant differences in the assumption of equal variances between early and late respondents. Therefore, non-response bias is not considered a concern in this study.

4.5 Common Method Bias

Common method variance (CMV), particularly single-source bias, can threaten the reliability and validity of the study items, potentially leading to flawed or skewed results (Garger et al., 2019). In this study, a full collinearity test was performed using WarpPLS 8.0 software. According to Kock (2015a), if all variance inflation factors (VIFs) from a full collinearity test are 3.3 or lower, the constructs can be regarded as free from common method bias.

**Table 4-3:
Full Collinearity Test**

	ATT	SN	PBC	FL	PR	INT	HD	OD
Full collinearity VIF	2.894	2.261	3.061	2.345	2.326	1.958	2.121	2.085

As shown in Table 4-3, the full collinearity VIFs for all constructs fall between 1.958 and 3.061, indicating that CMV is not a concern in this study.

4.6 Descriptive Statistics

After cleaning the data and testing all assumptions, the next step was to perform descriptive statistics, including an analysis of the demographic characteristics and key variable

4.6.1 Demographic Characteristics

The online questionnaire includes 13 demographic items to gather basic information such as states and federal territories, gender, age, race, marital status, number of children in the household, highest education level, employment status, individual monthly income, number of life insurance policies, types of life insurance policies bought, the mistakes made in life insurance decisions (suboptimal decisions made), and types of mistakes made (types of suboptimal decisions made).

**Table 4-4:
Respondents' Demographic Characteristics**

Demographic Variables	Descriptions	Frequency (N=304)	Percentage (%)
States and Federal Territories	Johor	33	10.9
	Kedah	16	5.3
	Kelantan	11	3.6
	Malacca	15	4.9
	Negeri Sembilan	17	5.6
	Pahang	13	4.3
	Penang	20	6.6
	Perak	18	5.9
	Perlis	5	1.6
	Sabah	21	6.9
	Sarawak	26	8.6
	Selangor	72	23.7
	Terengganu	11	3.6
	Federal Territories	26	8.6
Gender	Male	152	50.0
	Female	152	50.0
Age	18-22 years old	61	20.1
	23-27 years old	71	23.4
	28-32 years old	55	18.1
	33-37 years old	35	11.5
	38-42 years old	15	4.9
	43-47 years old	18	5.9
	48-52 years old	18	5.9
	53-57 years old	12	3.9
	58 years old and above	19	6.3
Race	Malay	106	34.9
	Chinese	115	37.8
	Indian	51	16.8
	Iban	13	4.3
	Bidayuh	5	1.6
	Kadazan	11	3.6

	Dusun	3	1.0
Marital Status	Single	152	50.0
	Married	119	39.1
	Widowed	19	6.3
	Divorced	6	2.0
	Separated	8	2.6
Number of children in the household	No children	118	38.8
	1-2 children	118	38.8
	3-4 children	60	19.7
	5 or more children	8	2.6
Highest education level	Primary level	13	4.3
	Secondary level	40	13.2
	Pre-university level (STPM/Foundation/Matriculation/Diploma)	67	22.0
	Undergraduate level (Bachelor's degree)	86	28.3
	Master's degree level	77	25.3
	Professional degree level	10	3.3
	Doctorate degree level	11	3.6
Employment status	Full-time employment	128	42.1
	Part-time employment	64	21.1
	Self-employed	84	27.6
	Housewife	20	6.6
	Retired	8	2.6
Individual monthly income	Less than RM1500	60	19.7
	RM1501-RM2500	83	27.3
	RM2501-RM3500	46	15.1
	RM3501-RM4500	42	13.8
	RM4501-RM5500	32	10.5
	More than RM5501	41	13.5
Number of life insurance policies	1	116	38.2
	2	106	34.9
	3	41	13.5
	4	14	4.6
	5 or more	27	8.9
Types of life insurance policies bought	Term plan (pays out only if death occurs during the term, no cash value)	58	10.6
	Endowment plan (pays out upon death or maturity, includes savings)	89	16.2
	Investment-linked plan (combines insurance with investment options)	79	14.4
	Whole life insurance (provides lifelong coverage, accumulates cash value)	156	28.5
	Life annuity plan (provides regular payments for life)	74	13.5
	Mortgage-reducing term assurance (MRTA) (pays off the mortgage if death occurs)	79	14.4
	Supplementary rider(s) (additional benefits such as accidental death, critical illness, and so on added to the main policy)	13	2.4
	Yes	99	32.6

Mistakes made (suboptimal decisions made)	No	205	67.4
Types of mistakes made (types of suboptimal decisions made)	Bought too much coverage (Purchased more life insurance than necessary, leading to higher premiums.)	27	17.9
	Chose the wrong type of policy (Selecting a policy that does not match financial needs or goals.)	63	41.7
	Bought too little coverage (Purchasing insufficient insurance to protect beneficiaries.)	23	15.2
	Misinterpreted insurance terms (Misunderstanding policy wording or features)	26	17.2
	Overlooked adding rider(s) (Failing to include optional benefits such as critical illness, long-term care, etc. that could enhance coverage.)	12	7.9

Table 4-4 shows that most of the respondents, at 72 (23.7%), are from Selangor. The gender distribution of the respondents is balanced, with 50.0% female and 50.0% male respondents. The sample's age distribution reveals that the largest group of respondents is between 23 to 27 years old, comprising 23.4% of the total sample.

Most of the respondents are Chinese, who constitute 37.8% of the sample, followed by Malays at 34.9% as shown in Table 4-4. The remaining racial groups are less represented, with Indians comprising 16.8%, and other indigenous groups such as Iban, Bidayuh, Kadazan, and Dusun constituting the remaining 10.5%. Besides, most of the respondents are single, representing 50.0% of the sample, followed by married individuals at 39.1% and widowed respondents at 6.3%. Additionally, most respondents have either no children (38.8%) or 1-2 children (38.8%) as displayed in Table 4-4.

Regarding the highest education level, most respondents are undergraduate degree holders (28.3%), followed by master's degree holders (25.3%), and pre-university certificate holders (22.0%). In terms of employment, most respondents participate in full-time jobs (42.1%), while a significant portion of respondents are self-employed (27.6%) or work part-time (21.1%). Based on Table 4-4, it is reported that most of the respondents have a monthly income ranging from RM1501 to RM2500 (27.3%).

Furthermore, in terms of life insurance, most individuals hold either one policy (38.2%) or two policies (34.9%). Among the multiple forms of life insurance, whole life insurance (which provides lifelong coverage, accumulates cash value) is the most prevalent, accounting for 28.5% of the policies. As shown in Table 4-4, approximately 32.6% of participants reported making suboptimal decisions regarding life insurance, with the most

common type being the selection of the wrong type of policy (41.7%), indicating that consumers select policies that do not match their financial needs or goals.

4.6.2 Descriptive Statistics of Variables

Table 4-5 displays the descriptive statistics of involving variables for this study. This study consisted of eight variables, which were attitude towards life insurance (ATT), subjective norm (SN), perceived behavioural control (PBC), financial literacy (FL), perceived risk (PR), intention to make optimal decisions for purchasing life insurance (INT), hyperbolic discounting (HD), and optimal decisions of life insurance purchasing behaviour (OD).

Table 4-5:
Descriptive Statistics of Variables

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Attitude towards life insurance	304	2.00	5.00	4.1173	0.62767
Subjective norm	304	1.33	5.00	3.9545	0.72795
Perceived behavioural control	304	1.67	5.00	4.0515	0.71298
Financial literacy	304	1.67	5.00	4.0784	0.65737
Perceived risk	304	1.00	5.00	3.0395	1.05170
Intention to make optimal decisions for purchasing life insurance	304	2.00	5.00	4.1425	0.62900
Hyperbolic discounting	304	1.00	5.00	2.9962	0.91352
Optimal decisions of life insurance purchasing behaviour	304	1.00	5.00	3.9189	0.79187

According to Table 4-5, the variable INT records the highest mean score at 4.1425. The standard deviation across the variables in this study ranges from 0.62767 to 1.05170. Most variables (attitude towards life insurance, perceived behavioural control, financial literacy, and intention to make optimal decisions for purchasing life insurance) have mean values above 4, suggesting that the respondents have demonstrated positive, favourable attitudes, perceived stronger control, possessed higher financial knowledge, and showed a higher tendency to make optimal decisions towards life insurance. Subjective norm (mean=3.9545) and optimal decisions of life insurance purchasing behaviour (mean=3.9189), suggesting a moderate level of social influence and optimal decision-making among respondents. Perceived risk (mean=3.0395) and hyperbolic discounting (mean=2.9962) were considerably lower, indicating that respondents perceive a lower level

of risk regarding life insurance and a lower tendency towards present-biased preferences compared to other variables.

4.6.3 Descriptive Statistics of Items

**Table 4-6:
Descriptive Statistics of Items**

Items	SD	D	N	A	SA
	n(%)	n(%)	n(%)	n(%)	n(%)
Attitude towards life insurance					
ATT1: Life insurance policy in my opinion prevents potential financial burden.	2(0.7%)	11(3.6%)	50(16.4%)	144(47.4%)	97(31.9%)
ATT2: Choosing the best life insurance in my opinion protects my loved one.	0(0.0%)	6(2.0%)	30(9.9%)	137(45.1%)	131(43.1%)
ATT3: I feel making optimal decisions regarding life insurance is really good for me.	1(0.3%)	6(2.0%)	43(14.1%)	144(47.4%)	110(36.2%)
ATT4: I feel connected to a community of buyers who value life insurance policies.	1(0.3%)	19(6.3%)	68(22.4%)	127(41.8%)	89(29.3%)
ATT5: I am motivated to make the best decisions regarding life insurance.	0(0.0%)	11(3.6%)	46(15.1%)	141(46.4%)	106(34.9%)
ATT6: I am determined to make the best decisions regarding life insurance.	2(0.7%)	10(3.3%)	48(15.8%)	134(44.1%)	110(36.2%)
Subjective norm					
SN1: My family's opinion of what I should do is important to me.	2(0.7%)	12(3.9%)	44(14.5%)	133(43.8%)	113(37.2%)
SN2: My friends think that I should make the best decisions regarding life insurance.	2(0.7%)	21(6.9%)	69(22.7%)	126(41.4%)	86(28.3%)
SN3: People I care about will remind me to buy the best life insurance policy to accumulate wealth.	3(1.0%)	20(6.6%)	61(20.1%)	113(37.2%)	107(35.2%)
SN4: I am motivated to accept social expectations in selecting the best life insurance policy.	5(1.6%)	15(4.9%)	65(21.4%)	128(42.1%)	91(29.9%)
SN5: I follow the opinions of family members.	1(0.3%)	17(5.6%)	52(17.1%)	125(41.1%)	109(35.9%)
SN6: I follow the opinions of friends.	5(1.6%)	37(12.2%)	82(27.0%)	98(32.2%)	82(27.0%)
Perceived Behavioural Control					
PBC1: I have enough sources of information for reference in life insurance policies.	4(1.3%)	22(7.2%)	69(22.7%)	122(40.1%)	87(28.6%)
PBC2: I understand what life insurance is.	3(1.0%)	17(5.6%)	57(18.8%)	117(38.5%)	110(36.2%)
PBC3: I have confidence in selecting the right life insurance policy that meets my needs.	3(1.0%)	22(7.2%)	60(19.7%)	129(42.4%)	90(29.6%)
PBC4: I am in full control of what I do.	2(0.7%)	12(3.9%)	52(17.1%)	115(37.8%)	123(40.5%)
PBC5: I am completely responsible for everything that results from my decisions.	1(0.3%)	7(2.3%)	37(12.2%)	138(45.4%)	121(39.8%)
PBC6: I make decisions from the very beginning to the very end.	0(0.0%)	14(4.6%)	45(14.8%)	135(44.4%)	110(36.2%)
Financial literacy					
FL1: An investment-linked life insurance with a high return rate will have a high-risk rate.	5(1.6%)	8(2.6%)	78(25.7%)	129(42.4%)	84(27.6%)
FL2: When the inflation rate increases, the cost-of-living increases.	0(0.0%)	5(1.6%)	52(17.1%)	111(36.5%)	136(44.7%)

FL3: I have a strong belief that the way that I manage my life insurance will affect my future.	2(0.7%)	10(3.3%)	54(17.8%)	138(45.4%)	100(32.9%)
FL4: It is essential to set financial goals for the future.	4(1.3%)	6(2.0%)	54(17.8%)	108(35.5%)	132(43.4%)
FL5: I compare the prices of life insurance policies.	3(1.0%)	11(3.6%)	53(17.4%)	122(40.1%)	115(37.8%)
FL6: I always reach the goals I set when managing my life insurance policy.	1(0.3%)	14(4.6%)	80(26.3%)	109(35.9%)	100(32.9%)
Perceived risk					
PR1: I fear that the life insurance policy I purchased will not meet my expectations.	31(10.2%)	64(21.1%)	73(24.0%)	91(29.9%)	45(14.8%)
PR2: I fear that the life insurance policy I purchased may not provide benefits.	38(12.5%)	69(22.7%)	67(22.0%)	86(28.3%)	44(14.5%)
PR3: I worry that the life insurance policy I purchased is not worth the money spent.	41(13.5%)	60(19.7%)	63(20.7%)	96(31.6%)	44(14.5%)
PR4: I do not think spending money on life insurance is wise.	56(18.4%)	92(30.3%)	75(24.7%)	51(16.8%)	30(9.9%)
PR5: I feel worried whether my decision regarding life insurance is the right one.	38(12.5%)	65(21.4%)	67(22.0%)	93(30.6%)	41(13.5%)
PR6: I feel anxious when buying a life insurance policy.	39(12.8%)	69(22.7%)	76(25.0%)	88(28.9%)	32(10.5%)
Intention to make optimal decisions for purchasing life insurance					
INT1: I intend to gather as much information as possible to make the best decisions for life insurance.	1(0.3%)	4(1.3%)	43(14.1%)	156(51.3%)	100(32.9%)
INT2: I plan to consider the pros and cons of a life insurance policy, aiming for the optimal decisions.	0(0.0%)	5(1.6%)	44(14.5%)	145(47.7%)	110(36.2%)
INT3: I intend to invest my time in making the best decisions for life insurance.	1(0.3%)	13(4.3%)	52(17.1%)	142(46.7%)	96(31.6%)
INT4: I intend to understand which insurance products suit me best.	1(0.3%)	10(3.3%)	44(14.5%)	138(45.4%)	111(36.5%)
INT5: I plan to make the best decisions regarding life insurance to avoid financial burdens.	0(0.0%)	8(2.6%)	38(12.5%)	144(47.4%)	114(37.5%)
INT6: I intend to buy the best life insurance policy in the future.	2(0.7%)	5(1.6%)	47(15.5%)	148(48.7%)	102(33.6%)
Hyperbolic discounting					
HD1: I would choose to receive an immediate prize of RM100 rather than waiting for RM200 two years from now.	29(9.5%)	80(26.3%)	76(25.0%)	73(24.0%)	46(15.1%)
HD2: It makes more sense to spend my money now rather than making optimal decisions towards life insurance purchases for the future.	34(11.2%)	106(34.9%)	72(23.7%)	71(23.4%)	21(6.9%)
HD3: Individuals should have time to enjoy themselves today.	17(5.6%)	60(19.7%)	87(28.6%)	88(28.9%)	52(17.1%)
HD4: I prefer immediate rewards over rewards that come later in the future although the immediate reward is smaller.	36(11.8%)	87(28.6%)	89(29.3%)	62(20.4%)	30(9.9%)
HD5: I often exhibit hesitation when considering long-term life insurance products.	29(9.5%)	68(22.4%)	85(28.0%)	90(29.6%)	32(10.5%)
HD6: I prefer short-term products compared to long-term life insurance products.	35(11.5%)	96(31.6%)	94(30.9%)	54(17.8%)	25(8.2%)
Optimal decisions of life insurance purchasing behaviour					
OD1: I have already gathered as much information as possible to make the best choice for life insurance.	5(1.6%)	31(10.2%)	51(16.8%)	124(40.8%)	93(30.6%)
OD2: I made the optimal decisions after weighing the pros and cons of life insurance policies.	4(1.3%)	16(5.3%)	56(18.4%)	142(46.7%)	86(28.3%)

OD3: I spent my time making optimal decisions for life insurance purchases.	5(1.6%)	15(4.9%)	56(18.4%)	147(48.4%)	81(26.6%)
OD4: I understood which insurance products suit me best.	4(1.3%)	20(6.6%)	70(23.0%)	122(40.1%)	88(28.9%)
OD5: I made optimal decisions for life insurance purchases to avoid financial burdens.	5(1.6%)	13(4.3%)	56(18.4%)	141(46.4%)	89(29.3%)
OD6: I bought the best life insurance policy.	7(2.3%)	17(5.6%)	71(23.4%)	120(39.5%)	89(29.3%)

According to Table 4-6, the results indicate that the respondents demonstrate a positive attitude towards life insurance, with the majority of respondents selecting “Agree” and “Strongly Agree” for all six items. ATT2 recorded the highest level of agreement (88.2%), reflecting a strong belief in life insurance as a means of protecting loved ones, followed by ATT3 (83.6%), which indicates that respondents perceive making optimal decisions about life insurance as highly beneficial to their personal well-being. ATT5 (81.3%) and ATT6 (80.3%) indicate that respondents not only feel motivated but also determined to make the best decisions regarding life insurance, reinforcing a strong commitment toward optimal decision-making. ATT1 noted an agreement level of 79.3%, indicating that most respondents believe life insurance policies help prevent potential financial burdens. This reflects a strong perception of the practical and protective value of life insurance in safeguarding against unexpected financial risks. Lastly, ATT4 recorded an agreement level of 71.1%, which, although positive, is comparatively lower than other items, suggesting that respondents feel less connected to a community of buyers who value life insurance.

For the construct of subjective norm, the descriptive statistics reveal that respondents show strong subjective norms regarding optimal decisions towards life insurance, as most respondents selected “Agree” and “Strongly Agree” across all six items. SN1 shows the highest agreement (81.0%), emphasising the significant role of family opinions in guiding decisions, followed by SN5 (77.0%) further reflects respondents’ tendency to follow family views. SN3 (72.4%) suggests that the significant others play a notable role in encouraging respondents to select the best life insurance policy. Similarly, SN4 (72.0%) highlights that meeting social expectations also serves as a motivating factor. Finally, friends’ influence appears slightly lower, as reflected in SN2 (69.7%), and is least displayed in SN6 (59.2%). Overall, these results suggest that family opinions exert the strongest influence, whereas peer influence remains relevant but less impactful.

For the construct of perceived behavioural control, the results display that respondents exhibit a strong sense of perceived behavioural control in optimal decisions of life insurance purchasing behaviour, with the majority choosing “Agree” and “Strongly Agree” for all six items. PBC5 (85.2%) revealed the highest agreement, showing that respondents feel completely responsible for outcomes of their decisions, followed by PBC6 (80.6%) and PBC4 (78.3%), which reflect confidence in maintaining full control throughout the decision-making process. PBC2 (74.7%) and PBC3 (72.0%) suggest that respondents understand life insurance and are confident in choosing suitable policies. However, PBC1 received the lowest agreement, implying 68.7% of respondents believe they have sufficient sources of information for life insurance policies, reflecting a generally positive perception. However, the remaining proportion suggests that some respondents may still face limitations in accessing comprehensive reference materials.

For the construct of financial literacy, Table 4-6 discovers that respondents generally possess a high level of financial literacy regarding life insurance, as reflected by the high proportion of “Agree” and “Strongly Agree” responses across all six items. FL2 (81.2%) and FL4 (78.9%) recorded the highest agreement levels, suggesting strong awareness of economic concepts such as inflation and the importance of setting financial goals. FL3 (78.3%) shows that respondents believe proper management of life insurance significantly impacts their future, followed by FL5 (77.9%) reflects active price comparison behaviour. FL1 (70.0%) indicates an understanding of the relationship between investment returns and risk, whereas FL6 (68.8%) suggests that while respondents aim to achieve their goals, consistency in doing so is slightly lower. Overall, the results show a generally strong level of financial literacy, with room for improvement in risk awareness and goal achievement.

For the construct of perceived risk, PR1 (29.9%), PR2 (28.3%), and PR3 (31.6%), the respondents selected “Agree” as the highest responses, indicating concerns about whether the purchased policy would meet expectations, provide benefits, or be worth the money spent. Similarly, PR5 (30.6%) and PR6 (28.9%) also recorded “Agree” as the highest response, reflecting worries about the appropriateness of decisions and feelings of anxiety during purchase. In contrast, PR4 showed “Disagree” as the highest response, with 30.3%, suggesting most respondents believe spending money on life insurance is wise.

For the construct of intention to make optimal decisions for purchasing life insurance, the descriptive statistics indicate that respondents generally hold strong intentions to make

optimal decisions for purchasing life insurance. Across all six items, the majority of participants selected “Agree” or “Strongly Agree”. Specifically, most respondents expressed a clear intention to gather sufficient information (INT1: 84.2%), weigh pros and cons carefully (INT2: 83.9%), and invest time in decision-making (INT3: 78.3%). Similarly, high levels of agreement were observed for intention to understand suitable products (INT4: 81.9%), avoiding future financial burdens through intention to make optimal decisions (INT5: 84.9%), and purchasing the best policy in the future (INT6: 82.3%). These findings collectively suggest a strong behavioural intention toward making well-informed and optimal decisions regarding life insurance.

For the construct of hyperbolic discounting, HD1 recorded “Disagree” as the highest response with 26.3%, indicating that slightly more respondents are cautious about choosing immediate rewards over larger delayed benefits. In HD2, the participants selected “Disagree” as the highest response (34.9%), showing that they prefer to consider future-oriented decisions rather than spending money immediately, reflecting a tendency towards long-term planning regarding life insurance. HD3 had the highest response as “Agree” (28.9%), indicating a strong inclination towards valuing present enjoyment. In HD4, the most selected category was “Neutral” (29.3%), showing uncertainty about whether to prioritise immediate rewards or future benefits, reflecting a balance between impulsive tendencies and future-oriented thinking. Besides, the highest response of HD5 was “Agree” (29.6%), implying that most respondents experience hesitation when considering long-term life insurance products, highlighting the perceived complexity or uncertainty of such decisions. Finally, HD6 showed the highest response as “Disagree” (31.6%), indicating that respondents generally prefer long-term life insurance products over short-term options, aligning with cautious and future-oriented financial behaviour.

For the construct of optimal decisions of life insurance purchasing behaviour, the largest proportion of respondents in OD1 selected “Agree” (40.8%), suggesting that most individuals had gathered sufficient information to make optimal decisions regarding life insurance. OD2 showed that 46.7% of respondents chose “Agree” as the highest response, indicating a deliberate evaluation of the pros and cons of various policies. In OD3, the highest proportion of respondents selected “Agree” (48.4%), showing that they invested substantial time in making optimal decisions regarding life insurance. In OD4, 40.1% of respondents selected “Agree” as the highest response, highlighting a clear understanding of

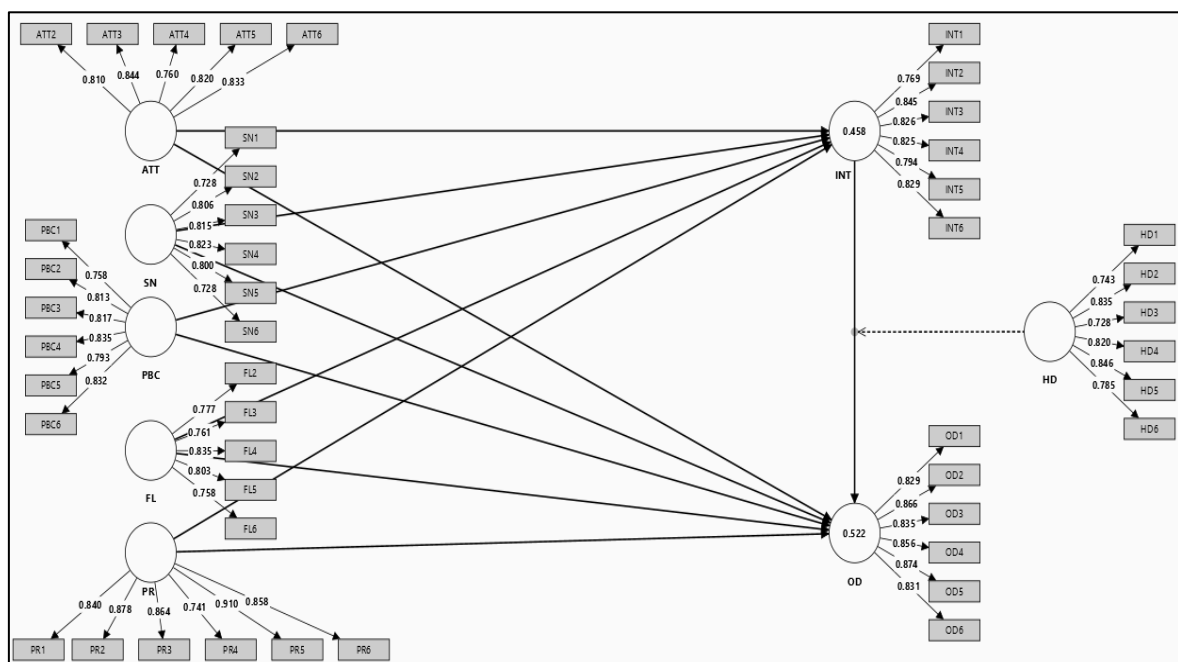
product suitability. A significant proportion of respondents in OD5 selected “Agree” (46.4%), showing the importance of avoiding potential financial burdens in optimal decisions of life insurance purchasing behaviour. Finally, for OD6, 39.5% of the respondents selected “Agree” as the highest response, suggesting confidence among respondents in choosing the most suitable life insurance policy.

4.7 Structural Equation Modelling (SEM)

4.7.1 Measurement Model

The measurement model is a crucial part of SEM, emphasising the relationship between latent variables and their associated indicators (Hair Jr et al., 2021). The measurement model also acts as a bridge between unobservable latent constructs and measurable observed variables. The primary purpose of the measurement model is to evaluate the constructs’ validity and reliability by ensuring that the selected indicators accurately represent the intended latent constructs. Figure 4-2 depicts the measurement model of this study after adjustment has been made.

**Figure 4-2:
Measurement Model**



4.7.1.1 Internal Consistency Reliability

Cronbach's alpha and composite reliability were performed in this study to determine internal consistency reliability.

Table 4-7:
Internal Consistency Reliability

Variables	Cronbach's Alpha	Composite Reliability
Attitude towards life insurance	0.872	0.907
Subjective norm	0.875	0.905
Perceived behavioural control	0.894	0.919
Financial literacy	0.846	0.891
Perceived risk	0.922	0.940
Intention to make optimal decisions for purchasing life insurance	0.899	0.922
Hyperbolic discounting	0.882	0.911
Optimal decisions of life insurance purchasing behaviour	0.922	0.939

According to Table 4-7, the values of Cronbach's alpha in this study range from 0.846 to 0.922, meeting the acceptable threshold of 0.7. Table 4-7 also indicates that the values of composite reliability for all constructs are greater than the minimum cut-off value of 0.7 within the range from 0.891 to 0.940. Although those constructs' composite reliability values exceed 0.9, they remain acceptable as they are below the 0.95 threshold (Hair et al., 2019; Mohd Dzin & Lay, 2021). The Cronbach's alpha and composite reliability results indicate that the measurement model demonstrates satisfactory reliability for all constructs.

4.7.1.2 Indicator Reliability (Outer Loadings)

Indicator reliability was conducted in this study using outer loadings.

Table 4-8:
Indicator Reliability

Constructs	Items	Loadings
Attitude towards life insurance	ATT2	0.810
	ATT3	0.844
	ATT4	0.760
	ATT5	0.820
	ATT6	0.833
Subjective norm	SN1	0.728
	SN2	0.806
	SN3	0.815
	SN4	0.823

	SN5	0.800
	SN6	0.728
Perceived behavioural control	PBC1	0.758
	PBC2	0.813
	PBC3	0.817
	PBC4	0.835
	PBC5	0.793
	PBC6	0.832
Financial literacy	FL2	0.777
	FL3	0.761
	FL4	0.835
	FL5	0.803
	FL6	0.758
Perceived risk	PR1	0.840
	PR2	0.878
	PR3	0.864
	PR4	0.741
	PR5	0.910
	PR6	0.858
Intention to make optimal decisions for purchasing life insurance	INT1	0.769
	INT2	0.845
	INT3	0.826
	INT4	0.825
	INT5	0.794
	INT6	0.829
Hyperbolic discounting	HD1	0.743
	HD2	0.835
	HD3	0.728
	HD4	0.820
	HD5	0.846
	HD6	0.785
Optimal decisions of life insurance purchasing behaviour	OD1	0.829
	OD2	0.866
	OD3	0.835
	OD4	0.856
	OD5	0.874
	OD6	0.831

Table 4-8 displays that all loading values are greater than 0.7, as recommended by Hair et al. (2010), except for ATT1 (0.653) and FL1 (0.698), as shown in Appendix H. Thus, all items except for ATT1 and FL1 have satisfactory indicator reliability in this study.

4.7.1.3 Convergent Validity

Convergent validity was performed in this study using AVE.

**Table 4-9:
Convergent Validity**

Constructs	Average Variance Extracted (AVE)
Attitude towards life insurance	0.662
Subjective norm	0.616
Perceived behavioural control	0.654
Financial literacy	0.620
Perceived risk	0.722
Intention to make optimal decisions for purchasing life insurance	0.664
Hyperbolic discounting	0.631
Optimal decisions of life insurance purchasing behaviour	0.720

According to Table 4-9, AVE values for all constructs are greater than 0.5, ranging from 0.616 to 0.722. Thus, the results indicate that the measurement model demonstrates evidence of convergent validity.

4.7.1.4 Discriminant Validity

In this study, cross loadings, the Fornell-Larcker criterion, and Heterotrait-monotrait ratio of correlation (HTMT) were performed to evaluate discriminant validity.

**Table 4-10:
Cross Loadings**

	ATT	FL	HD	INT	OD	PBC	PR	SN
ATT2	0.810	0.541	-0.152	0.512	0.476	0.584	-0.153	0.512
ATT3	0.844	0.563	-0.196	0.493	0.444	0.594	-0.203	0.578
ATT4	0.760	0.449	-0.274	0.385	0.489	0.597	-0.247	0.628
ATT5	0.820	0.532	-0.140	0.494	0.485	0.612	-0.238	0.557
ATT6	0.833	0.517	-0.122	0.509	0.474	0.575	-0.190	0.566
FL2	0.456	0.777	-0.106	0.461	0.377	0.470	-0.036	0.365
FL3	0.476	0.761	-0.165	0.394	0.402	0.500	-0.035	0.415
FL4	0.488	0.835	-0.128	0.510	0.420	0.531	-0.044	0.367
FL5	0.522	0.803	-0.066	0.509	0.423	0.498	-0.050	0.435
FL6	0.570	0.758	-0.083	0.431	0.533	0.594	-0.128	0.540
HD1	-0.159	-0.111	0.743	-0.088	-0.153	-0.140	0.493	-0.218
HD2	-0.139	-0.111	0.835	-0.201	-0.184	-0.183	0.608	-0.170
HD3	-0.131	-0.045	0.728	-0.079	-0.169	-0.188	0.579	-0.259
HD4	-0.190	-0.148	0.820	-0.156	-0.152	-0.187	0.550	-0.201

HD5	-0.234	-0.108	0.846	-0.142	-0.225	-0.236	0.644	-0.265
HD6	-0.155	-0.136	0.785	-0.209	-0.170	-0.180	0.522	-0.174
INT1	0.461	0.486	-0.150	0.769	0.453	0.502	-0.121	0.411
INT2	0.511	0.463	-0.169	0.845	0.454	0.502	-0.138	0.398
INT3	0.485	0.476	-0.173	0.826	0.451	0.508	-0.188	0.408
INT4	0.446	0.453	-0.140	0.825	0.483	0.479	-0.183	0.373
INT5	0.482	0.497	-0.121	0.794	0.436	0.490	-0.068	0.362
INT6	0.499	0.498	-0.148	0.829	0.455	0.535	-0.100	0.390
OD1	0.513	0.437	-0.243	0.459	0.829	0.590	-0.309	0.531
OD2	0.500	0.518	-0.158	0.484	0.866	0.571	-0.229	0.456
OD3	0.483	0.467	-0.155	0.507	0.835	0.523	-0.153	0.435
OD4	0.497	0.454	-0.212	0.470	0.856	0.550	-0.255	0.475
OD5	0.509	0.510	-0.205	0.511	0.874	0.600	-0.235	0.490
OD6	0.454	0.414	-0.166	0.411	0.831	0.515	-0.289	0.498
PBC1	0.609	0.511	-0.201	0.446	0.530	0.758	-0.296	0.614
PBC2	0.602	0.577	-0.196	0.501	0.551	0.813	-0.258	0.480
PBC3	0.531	0.474	-0.194	0.435	0.566	0.817	-0.288	0.542
PBC4	0.585	0.550	-0.210	0.526	0.530	0.835	-0.233	0.502
PBC5	0.593	0.532	-0.190	0.564	0.499	0.793	-0.199	0.470
PBC6	0.606	0.558	-0.161	0.514	0.523	0.832	-0.258	0.478
PR1	-0.228	-0.068	0.627	-0.093	-0.264	-0.273	0.840	-0.284
PR2	-0.184	0.014	0.611	-0.082	-0.208	-0.245	0.878	-0.224
PR3	-0.185	-0.019	0.623	-0.096	-0.251	-0.254	0.864	-0.249
PR4	-0.218	-0.139	0.553	-0.269	-0.169	-0.216	0.741	-0.106
PR5	-0.220	-0.075	0.642	-0.120	-0.263	-0.283	0.910	-0.261
PR6	-0.235	-0.080	0.599	-0.151	-0.299	-0.315	0.858	-0.263
SN1	0.496	0.399	-0.205	0.345	0.410	0.496	-0.161	0.728
SN2	0.563	0.418	-0.192	0.428	0.477	0.506	-0.206	0.806
SN3	0.630	0.455	-0.208	0.403	0.475	0.568	-0.249	0.815
SN4	0.585	0.448	-0.184	0.399	0.467	0.498	-0.220	0.823
SN5	0.528	0.443	-0.236	0.369	0.434	0.481	-0.183	0.800
SN6	0.458	0.383	-0.272	0.295	0.398	0.430	-0.278	0.728

According to Table 4-10, all indicators exhibit higher loadings on their assigned latent variables than the loadings on all other latent variables. Additionally, the difference between loadings across latent variables is not less than 0.1. Thus, it can be concluded that the indicators of different constructs are not interchangeable.

Table 4-11:
Fornell-Larcker Criterion

	ATT	FL	HD	INT	OD	PBC	PR	SN
ATT	0.814							
FL	0.641	0.787						
HD	-0.214	-0.137	0.794					

INT	0.590	0.588	-0.185	0.815				
OD	0.581	0.551	-0.225	0.559	0.849			
PBC	0.727	0.661	-0.237	0.617	0.659	0.808		
PR	-0.252	-0.076	0.718	-0.163	-0.290	-0.315	0.850	
SN	0.696	0.542	-0.272	0.479	0.567	0.635	-0.274	0.785

In the Fornell-Larcker criterion, the square root of AVE for each construct is greater than the correlations between the construct and other constructs in this study, demonstrating discriminant validity as displayed in Table 4-11.

Table 4-12:
HTMT

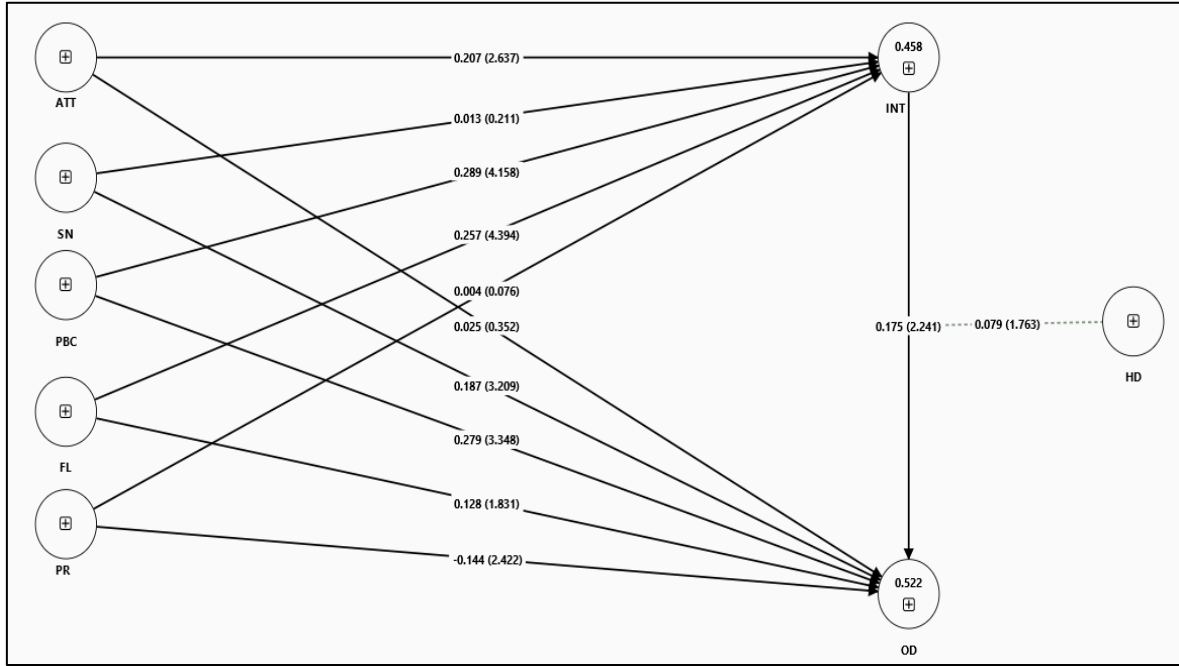
	ATT	FL	HD	INT	OD	PBC	PR	SN
ATT								
FL	0.741							
HD	0.245	0.171						
INT	0.664	0.672	0.206					
OD	0.648	0.619	0.244	0.613				
PBC	0.825	0.757	0.264	0.687	0.725			
PR	0.280	0.108	0.790	0.176	0.309	0.344		
SN	0.796	0.626	0.312	0.537	0.629	0.719	0.305	

According to Table 4-12, HTMT values are smaller than HTMT_{0.85} value of 0.85, indicating that there is no concern of discriminant validity.

4.7.2 Structural Model

After completing the measurement model, the next step involved assessing the structural model. In this study, the basic requirements to evaluate the structural model in PLS-SEM were the collinearity, significance of the path coefficient, the level of R^2 , the effect size (f^2), and the predictive relevance Q^2 . Figure 4-3 displays structural model of this model with path coefficients, β and t -values.

**Figure 4-3:
Structural Model**



Note: 0.05 significance level, one-tailed test, and 10,000 subsamples

**Table 4-13:
Assessment of Direct Effects**

	Direct Effect	β	BCI LL	BCI UL	<i>t</i> -value	<i>p</i> -value	Decision	<i>R</i> ²	<i>f</i> ²	VIF
H _{1a}	ATT→OD	0.025	-0.090	0.140	0.352	0.362	Not Supported	0.522	0.00	2.902
H _{1b}	SN→OD	0.187	0.093	0.285	3.209	0.001	Supported		0.03	2.160
H _{1c}	PBC→OD	0.279	0.143	0.418	3.348	0.000	Supported		0.06	2.959
H _{1d}	FL→OD	0.128	0.012	0.242	1.831	0.034	Supported		0.02	2.224
H _{1e}	PR→OD	-0.144	-0.236	-0.041	2.422	0.008	Supported		0.02	2.312

Note: BCI LL= Biased corrected interval lower limit, BCI UL= Biased corrected interval upper limit

4.7.2.1 Collinearity Issues

In the early stage of evaluating the structural model, it is essential to address the issue of lateral collinearity. As shown in Table 4-13, all VIF values for the independent variables are below 3.3, indicating that lateral collinearity is not a concern in this study.

4.7.2.2 Significance of Path Coefficient

The bootstrapping procedure was carried out to test hypotheses in this study. Regarding the number of resampling, it is recommended to use larger bootstrap subsamples such as 10,000 (Michelucci & Venturini, 2021). In SmartPLS 4, bootstrapping was set at a

0.05 significance level, using a one-tailed test with 10,000 subsamples. The critical values for a significant level of 1% ($\alpha = 0.01$), 5% ($\alpha = 0.05$), and 10% ($\alpha = 0.1$) are 2.33, 1.645, and 1.28 respectively for a one-tailed test (Hair Jr et al., 2017). According to Table 4-13, the result shows that PBC ($\beta=0.279$) is the most predictor of OD, followed by SN ($\beta=0.187$).

Since 0 does not straddle within the bias-corrected confidence intervals, the results indicate a significant effect of SN, PBC, FL, and PR on OD. Additionally, the result does not show a significant effect of ATT on OD as 0 straddles within the bias-corrected confidence intervals.

According to Table 4-13, it is discovered to have a t -value > 2.33 , thus the significance level at 0.01 for SN ($\beta=0.187$, $t=3.209$, $p=0.001$), PBC ($\beta=0.279$, $t=3.348$, $p=0.000$), and PR ($\beta=-0.144$, $t=2.422$, $p=0.008$). FL ($\beta=0.128$, $t=1.831$, $p=0.034$) is significant at the 0.05 level, as its t -value > 1.645 . However, ATT ($\beta=0.025$, $t=0.352$, $p=0.362$) exceeds the significance level of 0.05, indicating that ATT does not have a statistically significant effect on OD. Since the values of the path coefficient for SN, PBC, and FL are positive, SN, PBC, and FL have positive impacts on OD. Additionally, the path coefficient's value of PR is negative, revealing that PR negatively influences OD.

4.7.2.3 The Coefficient of Determination (R^2)

After assessing the significance of the structural model relationship, the level of R^2 was performed to evaluate the predictive accuracy of the model. R^2 was calculated using the PLS-SEM algorithm. The R^2 value of OD (0.522) can be considered substantial (Cohen, 1988) as displayed in Table 4-13.

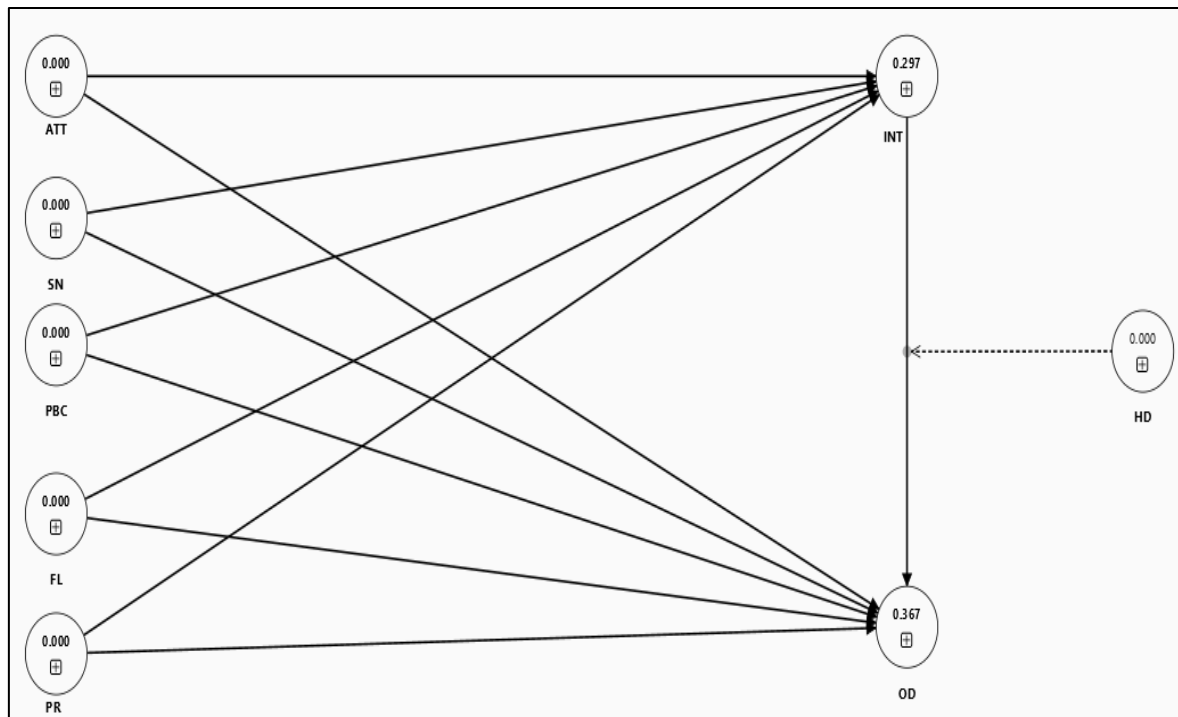
4.7.2.4 The f^2 Effect Size

The effect size of the predictor constructs in this study was determined using Cohen's f^2 , which measures the relative impact of a predictor construct on an endogenous construct in a structural model. According to Cohen (1988), f^2 values of 0.02, 0.15, and 0.35 are regarded as small, medium, and large effect sizes respectively. Based on Table 4-13, SN (0.03), PBC (0.06), FL (0.02), and PR (0.02) have small effects in producing R^2 for OD. In contrast, ATT does not have an effect in producing R^2 for OD.

4.7.2.5 The Predictive Relevance (Q^2)

The path model's predictive relevance (Q^2) was assessed in this study as shown in Figure 4-4. Stone and Geisser's Q^2 (Stone, 1974; Geisser, 1974) are often applied to evaluate predictive relevance and can be calculated using the blindfolding procedure, which is accessible for most PLS software packages. In this study, the blindfolding procedure was carried out using a distance value of 7 (Sarstedt et al., 2021). The predictive relevance Q^2 values for INT and OD are 0.297 and 0.367 respectively, demonstrating that the model possesses predictive relevance based on the two endogenous constructs as Q^2 values are significantly greater than zero.

Figure 4-4:
Blindfolding for Measuring Q^2



4.7.3 Mediation Analysis

Table 4-14:
Mediation Analysis

	Indirect Effect	β	BCI LL	BCI UL	<i>t</i> -value	<i>p</i> -value	Direct Effect	Type of Mediation	Pattern of Mediation
H _{2a}	ATT→INT→OD	0.036	0.010	0.084	1.718	0.086	ATT→OD $\beta=0.025$, $p=0.725$	Full mediation	None
H _{2b}	SN→INT→OD	0.002	-0.014	0.027	0.193	0.847	SN→OD	No mediation	None

H _{2c}	PBC→INT→ OD	0.051	0.016	0.105	1.923	0.054	$\beta=0.187,$ $p=0.001$ PBC→ OD	Partial mediation	Positive (complementary mediation)
H _{2d}	FL→INT→ OD	0.045	0.012	0.095	1.806	0.071	$\beta=0.279,$ $p=0.001$ FL→OD $\beta=0.128,$ $p=0.067$	Partial mediation	Positive (complementary mediation)
H _{2e}	PR→INT→ OD	0.001	-0.013	0.015	0.071	0.944	PR→OD $\beta=-0.144,$ $p=0.015$	No mediation	None

Note: BCI LL= Biased corrected interval lower limit, BCI UL= Biased corrected interval upper limit

In this study, the mediating role of INT was tested using bootstrapping. The cutoff value for the mediation analysis is 1.645 ($\alpha=0.10$) for a two-tailed test. Kock (2015b) stated that mediation tests often apply two-tailed tests because the researchers aim to determine whether the mediator has a statistically significant effect (either positive or negative), rather than assuming a specific direction of effect in advance.

For the indirect effect of bias-corrected confidence intervals as shown in Table 4-14, [LL= 0.010, UL= 0.084], [LL= 0.016, UL= 0.105], and [LL= 0.012, UL= 0.095], do not straddle a 0 in between, indicating there are mediation effects for ATT → INT → OD, PBC → INT → OD, and FL → INT → OD. However, [LL= -0.014, UL= 0.027] and [LL= -0.013, UL= 0.015], straddle a 0 in between, showing there are no mediation effects for SN → INT → OD and PR → INT → OD.

From Table 4-14 above, full mediation exists as the indirect relationship of ATT → INT → OD is significant ($\beta=0.036$, $p=0.086$) and direct relationship of ATT → OD ($\beta=0.025$, $p=0.725$) is not significant. Thus, H_{2a} is accepted.

Besides, H_{2c} is accepted as the relationships of PBC → INT → OD ($\beta=0.051$, $p=0.054$) and PBC → OD ($\beta=0.279$, $p=0.001$) are positive and significant, partial mediation is present. A positive $a * b \times c'$ ($0.051 \times 0.279 = 0.014$) shows complementary mediation. H_{2d} is also accepted as the relationships of FL → INT → OD ($\beta=0.045$, $p=0.071$) and FL → OD ($\beta=0.128$, $p=0.067$) are positive and significant, partial mediation is present. A positive $a * b \times c'$ ($0.045 \times 0.128 = 0.006$) indicates complementary mediation.

Lastly, H_{2b} is not accepted, as the indirect relationship of SN → INT → OD is not significant ($\beta=0.002$, $p=0.847$) and the direct relationship of SN → OD is significant ($\beta=0.187$, $p=0.001$). H_{2e} is also not accepted as the indirect relationship of PR → INT → OD

is not significant ($\beta=0.001$, $p=0.944$) and the direct relationship of PR → OD is significant ($\beta=-0.144$, $p=0.015$).

4.7.4 Moderation Analysis

After testing the mediation, the moderation hypothesis was tested using SmartPLS 4. This study hypothesised that:

H₁₁: *The positive relationship between the intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour is stronger for lower hyperbolic discounting.*

In moderation analysis, R^2 change becomes an essential issue. The R^2 value for the main effect model is 0.515 and the R^2 for the interaction effect model is 0.522. The R^2 change of 0.02 reveals that the inclusion of one interaction term has increased the R^2 value by approximately 2% (additional variance). The effect size (f^2) was calculated using the formula given below:

$$f^2 = \frac{R^2 \text{ included moderator} - R^2 \text{ excluded moderator}}{1 - R^2 \text{ included moderator}}$$

$$f^2 = \frac{0.522 - 0.515}{1 - 0.522}$$

$$f^2 = 0.015$$

$$f^2 \approx 0.02$$

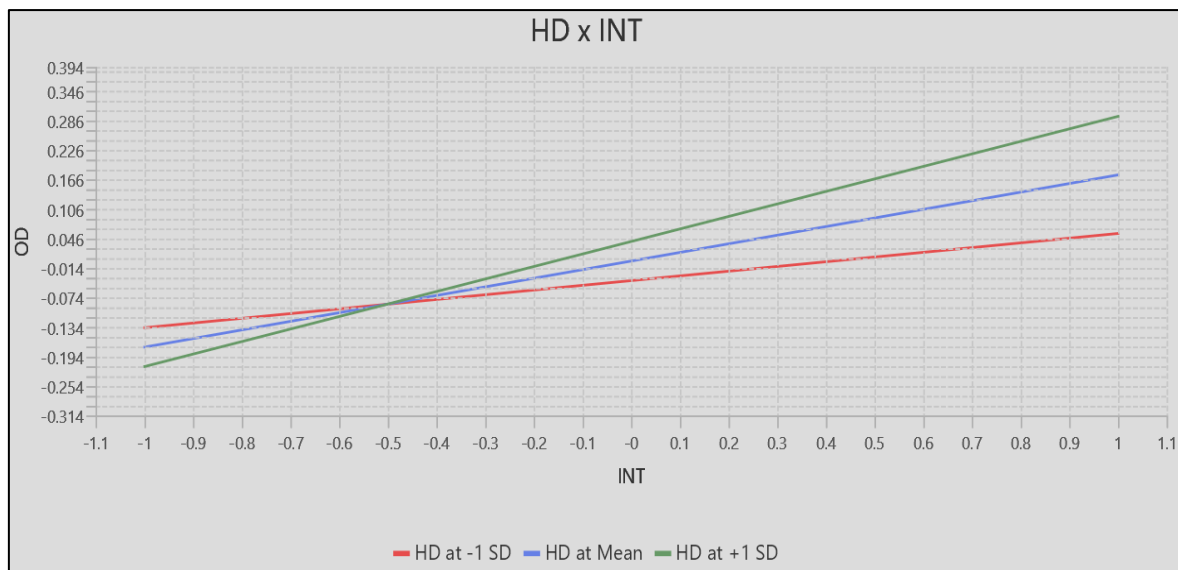
Based on the f^2 of 0.02, the effect size is considered small (Cohen, 1988). Then, the bootstrapping procedure was performed to detect whether the interaction effect is significant. The cutoff value is 1.645 ($\alpha=0.05$) for a one-tailed test. According to Table 4-15 below, the interaction term of HD × INT→OD is significant ($t=1.763$).

Table 4-15:
Assessment of Moderation Model

Hypotheses	Interaction Effect	Path Coefficient	Standard Error	t-value	p-value
H ₃	HD×INT→OD	0.079	0.045	1.763	0.039

After performing bootstrapping, an interaction plot can be carried out to visualise whether the effect is stronger, weaker, positive, or negative at different levels of the moderator. According to Figure 4-5 below, the green line indicating higher HD has a steeper gradient compared to the red line indicating lower HD. This indicates that the positive relationship between INT and OD is stronger when HD is higher. However, this finding contrasts with H₃. Therefore, H₃ is not supported.

**Figure 4-5:
Interaction Plot**



4.8 Summary of Hypotheses Testing

In summary, data preparation was carried out in this study to ensure its accuracy and suitability for subsequent statistical analysis. Assumption testing, such as normality test, normality of error terms, homoscedasticity, and autocorrelation was performed to minimise the risk of bias and enhance the reliability of the findings. Besides, non-response bias check and common method variance were also performed in this study. Then, the respondents' demographic characteristics and constructs were displayed using descriptive statistics. Both measurement and structural models were also carried out through the software of SmartPLS 4. Additionally, moderation and mediation analyses were also performed. Table 4-16 presents a summary of the hypotheses testing results.

Table 4-16:
Summary of Hypotheses Testing

No.	Hypotheses Statement	Decision
H _{1a}	Attitude towards life insurance has a positive effect on the optimal decisions of life insurance purchasing behaviour.	Not Supported
H _{1b}	Subjective norm has a positive effect on the optimal decisions of life insurance purchasing behaviour.	Supported
H _{1c}	Perceived behavioural control has a positive effect on the optimal decisions of life insurance purchasing behaviour.	Supported
H _{1d}	Financial literacy has a positive effect on the optimal decisions of life insurance purchasing behaviour.	Supported
H _{1e}	Perceived risk has a negative effect on the optimal decisions of life insurance purchasing behaviour.	Supported
H _{2a}	Intention to make optimal decisions for purchasing life insurance mediates the relationship between attitude towards life insurance and optimal decisions of life insurance purchasing behaviour.	Supported
H _{2b}	Intention to make optimal decisions for purchasing life insurance mediates the relationship between subjective norm and optimal decisions of life insurance purchasing behaviour.	Not Supported
H _{2c}	Intention to make optimal decisions for purchasing life insurance mediates the relationship between perceived behavioural control and optimal decisions of life insurance purchasing behaviour.	Supported
H _{2d}	Intention to make optimal decisions for purchasing life insurance mediates the relationship between financial literacy and optimal decisions of life insurance purchasing behaviour.	Supported
H _{2e}	Intention to make optimal decisions for purchasing life insurance mediates the relationship between perceived risk and optimal decisions of life insurance purchasing behaviour.	Not Supported
H ₃	The positive relationship between the intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour is stronger for lower hyperbolic discounting.	Not Supported

4.9 Discussion of the Results

Over the past decade, the field of consumer optimal decision-making in insurance markets has been widely discussed (Pal et al., 2023). This study adopted TPB and integrated it with the hyperbolic discounting model to provide a greater insight of optimal decisions of life insurance purchasing behaviour among households in Malaysia. The optimal decisions of life insurance purchasing behaviour was primarily examined using TPB in conjunction with its major determinants such as attitude towards life insurance, subjective norm, and perceived behavioural control through the mediating role of intention to make optimal decisions for purchasing life insurance. Additional determinants such as financial literacy and perceived risk were incorporated into the theory to further explain optimal decisions of

life insurance purchasing behaviour. This study was conducted to address the following research objectives:

1. To investigate the effects of attitude, subjective norm, perceived behavioural control, financial literacy, and perceived risk on the optimal decisions of life insurance purchasing behaviour.
2. To assess the mediating effect of intention to make the optimal decisions for purchasing life insurance on the relationship between attitude, subjective norm, perceived behavioural control, financial literacy, perceived risk, and optimal decisions of life insurance purchasing behaviour.
3. To examine the moderating effect of hyperbolic discounting on the relationship between the intention to make optimal decisions for purchasing life insurance and the optimal decisions of life insurance purchasing behaviour.

The research objectives above serve as the foundation for three main hypotheses in this study.

4.9.1 Research Objective 1

4.9.1.1 Hypothesis 1a

***H_{1a}**: Attitude towards life insurance has a positive effect on the optimal decisions of life insurance purchasing behaviour.*

In this study, attitude towards life insurance does not significantly and positively influence the optimal decisions of life insurance purchasing behaviour. TPB is not adequate to explain how attitude towards life insurance shapes the optimal decisions of life insurance purchasing behaviours. This finding is consistent with the results of Hartono et al. (2025), which also found no significant effect of consumer attitudes on rational and optimal financial planning. However, this finding contrasts with other studies that reported a significant positive relationship between favourable attitude and optimal decision-making in specific behavioural contexts (Mbada et al., 2013; Chowdhury & Humaira., 2024).

Firstly, the insignificant effect of attitude towards life insurance on the optimal decisions of life insurance purchasing behaviour can be explained using the Marshallian and Hicksian demand framework (Hicks, 1975; Marshall, 2013; Hilton, 2025). Hicksian demand

represents the consumer's ideal preference under constant utility, reflecting what individuals would choose if income and external constraints were absent. In contrast, Marshallian demand reflects actual optimal decisions of purchasing behaviour under real-world budget limitations and price conditions. Although individuals may hold a favourable attitude toward life insurance as a rational means of achieving long-term financial security, their actual (Marshallian) decisions often deviate from these ideal (Hicksian) preferences due to financial constraints, liquidity issues, and competing short-term needs.

The insignificant influence of attitude towards life insurance on the optimal decisions of life insurance purchasing behaviour can also be explained through Maslow's hierarchy of needs. According to Maslow (1943), individuals prioritise their needs in a hierarchical order. Although a positive attitude toward life insurance may reflect awareness of its importance in providing financial security (a component of safety and security needs), actual optimal decisions of life insurance purchasing behaviour are often constrained by the prioritisation of physiological needs, such as food, shelter, and clothing. When basic needs are not fully satisfied, individuals tend to allocate resources toward meeting these immediate necessities rather than engaging in long-term financial planning, even if they hold a favourable attitude toward life insurance. The actual optimal decisions of life insurance purchasing behaviour are more likely to occur when higher-order needs and financial stability are achieved, enabling individuals to prioritise future security.

Besides, the lack of a significant relationship may be attributed to consumers having little interest in life insurance products themselves. Consumers might seek to make optimal decisions for life insurance purchases not because they have a positive attitude towards life insurance, but because they desire to ensure financial security for the future. Even when consumers do purchase life insurance, their lack of interest might hinder them from regularly reviewing and optimising their policies to ensure they continue to meet their needs as circumstances change over time. Additionally, when consumers lack interest in life insurance, they may rely heavily on external advice, such as from agents or financial advisors, without critically evaluating the options themselves (Anagol et al., 2017). This reliance can expose them to biased recommendations that prioritise sales over their best interests.

In addition, the lack of a significant relationship between attitude towards life insurance and optimal decisions of life insurance purchasing behaviour may be because consumers often prioritise social norms or peer pressure over their personal attitudes (Payne

et al., 2016). Individuals tend to trust their peers' opinions or seek guidance from their peers on acceptable behaviours, leading them to conform to group expectations, such as making optimal decisions related to purchasing life insurance, even if their personal beliefs differ. The peer pressure can be heightened by emotional factors such as the fear of exclusion and the desire for social acceptance. In the long run, repeated conformity may reshape individual attitudes to align with social expectations.

Furthermore, the lack of a significant connection between attitude towards life insurance and optimal decisions of life insurance purchasing behaviour can be attributed to habitual behaviour (Brown, 2024). Habitual behaviour plays a necessary role in the process of optimal decision, specifically in purchasing life insurance, often making current attitudes less influential. Habitual behaviour occurs through repeated actions, causing consumers to rely on past experiences to guide future decisions without conscious reflection. In the case of life insurance, consumers who have previously purchased policies may automatically renew or select similar options, prioritising convenience and minimising cognitive effort. As these decisions become routine, individuals are less likely to reassess their attitudes or explore alternative options, resulting in a diminished role for personal beliefs in making optimal decisions.

Lastly, the lack of a significant relationship between attitude towards life insurance and optimal decisions of life insurance purchasing behaviour can be due to high premiums and limited options (Coe et al., 2016; Mousa et al., 2016). High premiums and limited options may hinder consumers from making optimal decisions, even if they hold positive attitude towards life insurance. Higher premiums can create financial constraints, leading consumers to forgo insurance or select cheaper policies. Additionally, limited options in the insurance market may restrict their ability to find suitable coverage, resulting in frustration or feelings of helplessness. As a result, even a positive attitude towards life insurance may not translate into optimal decisions as financial and market barriers may significantly influence their decisions and choices. Thus, it is concluded that attitude towards life insurance does not significantly and positively influence the optimal decisions of life insurance purchasing behaviour.

4.9.1.2 Hypothesis 1b

H_{1b}: Subjective norm has a positive effect on the optimal decisions of life insurance purchasing behaviour.

This finding supports H_{1b}, indicating that subjective norm has a significant and positive effect on the optimal decisions of life insurance purchasing behaviour. This finding supported the assumption of TPB that subjective norm influences the optimal decisions of life insurance purchasing behaviour. Within TPB, when individuals believe that important others view life insurance as a symbol of financial responsibility and security, they experience a stronger motivation to conform to these expectations, thereby increasing the likelihood of making optimal decisions of life insurance purchasing behaviour. The social approval and validation derived from conforming to these norms reduce psychological uncertainty and strengthen confidence in their financial choices. This finding is consistent with Shamsie (2024), who suggested that peer influence can positively shape lifestyle decisions, social interaction, and overall performance, indicating that peers play a crucial role in fostering optimal decision-making. Similarly, Rollings et al. (2023) also discovered that individuals with higher level of extraversion may positively influence optimal decision-making by utilising their social engagement and collaborative abilities to obtain diverse viewpoints and develop more effective solutions.

The positive effect of subjective norm on optimal decisions of life insurance purchasing behaviour can be interpreted using Maslow's hierarchy of needs. According to Maslow (1943), belongingness and love needs reflect individuals' desire for social connection, acceptance, and emotional support. In the context of decision-making, these needs can influence optimal choices when individuals consider the expectations or opinions of family, friends, or peers. For instance, social encouragement or approval may motivate individuals to make optimal decisions regarding life insurance to protect their loved ones, fulfilling both financial and relational objectives. Thus, subjective norms acts as driver that align personal decisions with social expectations, enhancing the likelihood of optimal and responsible behaviour.

Besides, Lee et al. (2021) suggested that social networks can guide optimal decision-making in life insurance investments. Social networks can create a learning environment, where individuals adjust their strategies by observing actions of friends, peers, or neighbours. It is also supported by Wirawan et al. (2022) who stated that subjective norm positively

influence investment decisions, indicating that external pressures from observers and friends can enhance individuals' ability to make optimal decisions, including the purchase of life insurance.

In addition, the significant relationship between subjective norm and optimal decisions of life insurance purchasing behaviour can be explained by the influence of social proof and trust in others' opinions (Ardakani et al., 2020; Bhatti et al., 2020). When consumers face complex decisions, such as purchasing life insurance, they often rely on the actions and advice of people they trust, such as family, friends, or experts, to guide their decisions. This reliance on social proof helps reduce uncertainty and builds confidence in the process of decision-making. As a result, when individuals observe others in their social circle endorsing or recommending life insurance, they are more likely to meet these social expectations, strengthening the impact of subjective norm on optimal decisions of life insurance purchasing behaviour.

Moreover, the significant relationship between subjective norm and optimal decisions of life insurance purchasing behaviour may be due to the desire for social acceptance (Samah, 2018; Al Kurdi et al., 2021). The desire for social acceptance may motivate individuals to make optimal decisions that help them maintain a positive image and avoid social criticism. For instance, if purchasing life insurance is socially viewed as a wise or responsible decision, such normative influence may encourage people to make more optimal decisions regarding life insurance, even though they have no personal desire to purchase it. In doing so, they secure social approval and show they are making optimal decisions, ultimately improving their social standing. Therefore, it can be concluded that subjective norm has a positive effect on the optimal decisions of life insurance purchasing behaviour.

4.9.1.3 Hypothesis 1c

***H_{1c}:** Perceived behavioural control has a positive effect on the optimal decisions of life insurance purchasing behaviour.*

This finding supports H_{1c}, indicating that perceived behavioural control has a positive effect on the optimal decisions of life insurance purchasing behaviour. TPB is adequate to explain how perceived behavioural control affects the optimal decisions of life insurance purchasing behaviour. Within TPB, individuals with higher perceived control are more likely

to evaluate insurance options thoroughly, manage premiums effectively, and make optimal decisions that align with long-term financial security. Perceived behavioural control also reduces the impact of external barriers, facilitating actual, utility-maximising, and optimal decisions of life insurance purchasing behaviour.

The significant effect of perceived behavioural control on optimal decisions of life insurance purchasing behaviour can be interpreted using expected utility theory (Bernoulli, 1990; Hou, 2025). According to expected utility theory, individuals make optimal decisions by evaluating uncertain outcomes to maximise their expected utility. In the context of life insurance, perceived behavioural control reflects the individual's confidence in managing premiums, understanding policy terms, and assessing potential financial risks. Higher perceived behaviour control enables individuals to accurately evaluate the expected utility of different insurance options, leading to informed, rational, and optimal purchasing decisions.

Masud et al. (2021) who discovered that perceived behavioural control positively influences the optimal decisions regarding life insurance among households through SEM analysis. When households believe that they have the ability to make optimal decisions and access life insurance, they are prone to proceed with the purchase. This is essential in the insurance market as many individuals may feel overwhelmed or stressed about insurance options.

Wang et al. (2021) also stated that individuals with high perceived behavioural control are more willing to take calculated risks as they feel equipped to handle potential uncertainties. However, those with low perceived behavioural control may exhibit higher risk aversion, leading them to avoid purchasing life insurance due to fears of making suboptimal decisions or not fully understanding of the products.

In addition, Ansel et al. (2016) also revealed that when individuals believe they can effectively manage life insurance products with minimal uncertainty, they tend to make more optimal and rational decisions. A strong sense of control helps people think more logically, as their cognitive process is less clouded by fear or uncertainty. This clarity enables them to better evaluate the available options, leading to optimal decisions which meet their goals and needs.

Furthermore, Yeow et al. (2021) also discovered that perceived behavioural control helps individuals navigate and overcome barriers by instilling a sense of confidence in their ability to handle challenges. This confidence enables them to approach complex decisions, such as purchasing life insurance, with greater confidence, reducing hesitation and fostering more positive outcomes. As a result, they are more prone to yield informed and optimal decisions, even in the face of obstacles, aligning their choices with long-term goals and needs. Thus, it can be deduced that perceived behavioural control has a positive effect on optimal decisions of life insurance purchasing behaviour.

4.9.1.4 Hypothesis 1d

H_{1d}: Financial literacy has a positive effect on the optimal decisions of life insurance purchasing behaviour.

This finding supports H_{1d}, indicating that financial literacy has a positive and significant effect on the optimal decisions of life insurance purchasing behaviour. TPB is sufficient to explain how financial literacy shapes the optimal decisions of life insurance purchasing behaviour. Within the extended framework of TPB, a higher level of financial literacy enhances consumers' confidence and positive evaluation of life insurance, leading to more optimal decisions. Moreover, individuals with greater financial literacy are better able to assess long-term benefits and perceive life insurance premiums as a valuable investment rather than an immediate cost.

The significant effect of financial literacy on optimal decisions of life insurance purchasing behaviour can also be explained using human capital theory (Becker, 1975; Hasan & Alam, 2025). Human capital theory posits that individuals' knowledge and skills establish valuable assets that enhance their decision-making capabilities and contribute to future economic productivity. Within this framework, financial literacy is recognised as a critical form of human capital, helping individuals with the ability to understand financial products, assess risks and returns accurately, and plan for long-term financial needs. In the context of life insurance, individuals with higher financial literacy are better able to understand the strategic role of insurance in protecting their human capital, namely their earning potential and future productivity. Moreover, they are more likely to appreciate the importance of securing financial stability for their dependents. As a result, financially literate

individuals are more capable of making optimal decisions regarding life insurance that maximise long-term benefits and reduce potential economic losses.

This finding aligns with the study of Katauke et al. (2023), which argued that financial literacy is negatively related to impulsivity, leading to more optimal decisions. Besides, Iqbal et al. (2023) also suggested that enhancing financial literacy in making optimal decisions can significantly improve financial satisfaction, which is particularly essential in complex financial environments where individuals face numerous financial choices.

In addition, Weedige et al. (2019) also discovered that financial literacy plays a vital role in enhancing consumers' understanding of risk and insurance products, which is essential in making optimal decisions. Consumers with higher financial literacy are more possible to develop trust in insurance products as they can better comprehend the advantages and features of these offerings, fostering a favourable attitude towards purchasing insurance and leading to more informed, optimal decision-making.

Moreover, Bustani (2024) showed that higher financial literacy allows individuals to make optimal investment decisions by understanding the risks and benefits involved. This reduces the chances of misconceptions and fear-driven choices, helping them avoid costly mistakes. As a result, they are more likely to achieve balanced and suitable financial outcomes aligned with their goals.

In contrast, Dunn (2023) revealed that financial literacy does not guarantee that individuals have precise or current information, as the complexities and unpredictability of financial markets make it challenging for most consumers to stay informed. Even well-informed individuals may struggle to keep up with constantly evolving market conditions, regulatory changes, and product updates, often leading to decisions based on outdated or incomplete information. This limitation implies that financial knowledge alone is insufficient to guarantee optimal decision-making in an ever-evolving financial environment.

Lusardi and Mitchell (2014) also discovered that financial literacy can improve optimal decisions, but it also reveals that external constraints, such as low income or prohibitive costs, may impede their ability to make optimal financial decisions. Even with a comprehensive understanding of financial principles, individuals facing limited financial

resources may find it challenging to translate this knowledge into practical action. For instance, although someone may recognise the importance of saving or investing, a lack of disposable income or liquidity could prevent them from engaging, potentially resulting in suboptimal financial decisions. Asuamah Yeboah (2024) also argued that low-income individuals may be limited in their ability to follow their idealised financial model, as much of their income is allocated to essential expenses such as housing, food, utilities, and so on. Additionally, macroeconomic factors like inflation, rising living costs, and income volatility further constrain optimal decisions regarding financial behaviour, illustrating that financial literacy alone is insufficient to overcome the barriers that influence optimal decision-making. Therefore, based on the discussion above, it is concluded that financial literacy has a positive and significant effect on the optimal decisions of life insurance purchasing behaviour.

4.9.1.5 Hypothesis 1e

H_{1e}: Perceived risk has a negative effect on the optimal decisions of life insurance purchasing behaviour.

This finding supports H_{1e}, indicating that perceived risk has a negative effect on the optimal decisions of life insurance purchasing behaviour. TPB is adequate to explain how perceived risk affects the optimal decisions of life insurance purchasing behaviour. Within the extended framework of TPB, higher perceived risk reduces individuals' confidence in selecting life insurance, leading to less optimal decisions. When individuals perceive greater uncertainty or potential financial loss, their sense of control over the decision-making process diminishes. Consequently, even if they have positive attitudes or supportive subjective norms, the higher perceived risk may prevent them from making optimal decisions regarding life insurance.

The significant effect of perceived risk on optimal decisions of life insurance purchasing behaviour can be interpreted using Maslow's hierarchy of needs (Maslow, 1943; Zhang et al., 2025). Safety needs, as mentioned in Maslow's hierarchy of needs, reflect individuals' desire for security, stability, and protection from financial losses. In the context of life insurance, these needs are directly related to perceived risk, as higher perceived risk creates uncertainty about financial protection and the ability to safeguard oneself and dependents. When perceived risk is high, individuals may feel their safety is compromised, reducing confidence in selecting appropriate policies and leading to less optimal decisions.

Conversely, when perceived risk is low, individuals feel their safety needs are adequately addressed, which enhances confidence and facilitates more informed and optimal decisions regarding life insurance.

The findings are consistent with Ainia and Lufti (2019), who also concluded that perceived risk hinders consumers from making optimal decisions in the investment field. This relationship occurs due to uncertainty and fear. Reio Jr (2020) highlighted how uncertainty often breeds fear, especially concerning personal safety, health, and financial stability. In the context of life insurance, this fear can result in individuals making suboptimal decisions, as they may prefer to remain in their comfort zones rather than confront unknown risks.

Besides, Ghimire and Ghimire (2024) also noted that most potential buyers may seek life insurance products complicated due to the numerous terms, conditions, and options available. This complexity can lead to confusion, making it challenging for consumers to make optimal decisions about which policy best suits their needs.

Furthermore, Raue and Schneider (2019) revealed that perceived risk often triggers the consumers relying on heuristics and emotional responses, leading them to make rapid, instinctive decisions. These reactions can diminish logical and analytical evaluations, causing people to prioritise immediate concerns over long-term benefits. As a result, perceived risk can contribute to biased judgments and less optimal decision-making.

Jain et al. (2023) discovered that perceived risk is often shaped by an individual's confidence in their decision-making abilities. Uncertainty about the financial product or fear of making a poor decision might lead to a lack of consumer confidence. The consumers with lower confidence may become overly cautious or paralysed by doubt, resulting in hesitation or deferral in making optimal decisions. It is also suggested by Peters (2022) who showed that lower confidence can heighten perceived risks, leading to inaccurate decision-making. Therefore, it is deduced that perceived risk has a negative effect on optimal decisions of life insurance purchasing behaviour.

4.9.2 Research Objective 2

4.9.2.1 Hypothesis 2a

H_{2a}: Intention to make optimal decisions for purchasing life insurance mediates the relationship between attitude towards life insurance and optimal decisions of life insurance purchasing behaviour.

In this study, this finding supports H_{2a}, showing that intention to make optimal decisions for purchasing life insurance fully mediates the relationship between attitude towards life insurance and optimal decisions of life insurance purchasing behaviour. TPB is able to explain how the intention to make optimal decisions for purchasing life insurance mediates the relationship between attitude and optimal decisions of life insurance purchasing behaviour. Within the framework of TPB, a positive attitude towards life insurance translates into strong intentions, which in turn guide their optimal decision-making regarding life insurance. This finding contrasts with Xiang et al. (2023), who stated that behavioural intention partially mediated the relationship between affective attitudes and actual decisions among Chinese primary school teachers.

This finding can also be explained through Maslow's hierarchy of needs (Maslow, 1943). A positive attitude toward life insurance may reflect individuals' awareness of its importance in providing financial security, which corresponds to the safety and security needs. When individuals perceive that life insurance can fulfil these needs, they are motivated to translate their positive evaluation into a concrete intention to act. Once the intention is formed, it subsequently leads to actual optimal decisions of life insurance purchasing behaviour, indicating motivation derived from safety and security needs serves as a crucial psychological mechanism linking attitude, behavioural intention, and actual decisions.

Chen et al. (2020) revealed that full mediation of intention occurs because a positive ATT encourages the consumers to develop a strong intention to make optimal decisions, which results in final decisions. A favourable attitude may not lead to OD without the presence of intention, as the intention serves as the bridge between attitudes and actual decision-making. Consequently, the behavioural intentions help to ensure that positive attitudes are translated into practical, informed, and optimal decisions.

Besides, Thorhauge et al. (2019) found that full mediation occurs because intention helps individuals actively plan and purposefully decide based on their attitudes, making intention the necessary step to turn attitudes into OD. The presence of intention ensures that individuals do not act impulsively and make thoughtful, well-considered decisions. By channelling attitudes into focused intentions, individuals are more likely to engage in decisions that align with their long-term goals and values. This process leads to more consistent and rational behaviours, such as purchasing the most suitable life insurance policy. Therefore, it is deduced that intention to make optimal decisions for purchasing life insurance fully mediates the relationship between attitude towards life insurance and optimal decisions of life insurance purchasing behaviour.

4.9.2.2 Hypothesis 2b

H_{2b}: Intention to make optimal decisions for purchasing life insurance mediates the relationship between subjective norm and optimal decisions of life insurance purchasing behaviour.

This finding does not support H_{2b}, stating that intention to make optimal decisions for purchasing life insurance does not mediate the relationship between subjective norm and optimal decisions of life insurance purchasing behaviour. This contrasts with the findings of Masud et al. (2021), which found that intention partially mediates the relationship between SN and final decision regarding life insurance among the households. Ilmi et al. (2024) also revealed that the intention fully mediates the relationship between SN and zakat compliance.

TPB fails to explain how the intention to make optimal decisions for purchasing life insurance mediates the relationship between subjective norm and optimal decisions of life insurance purchasing behaviour. Within the framework of TPB, individuals may comply with family or peer expectations directly, without forming deliberate intentions. In such circumstances, normative pressure may trigger immediate compliance driven by a sense of obligation or social responsibility, rather than through intentional planning. This phenomenon can be better explained by social influence theory, which posits that individuals often conform to social expectations through mechanisms such as compliance, identification, and internalisation (Kelman, 1958; Davlembayeva et al., 2025). According to social influence theory, normative pressure may induce specific decisions that are motivated by the desire for social approval or fear of social disapproval, leading to actions that bypass the

formation of behavioural intentions. Consequently, these socially influenced decisions are less likely to be mediated by intention, which is typically shaped by personal evaluations and perceived control (Andrighetto et al., 2015; Parsons Leigh, 2023). Similarly, Rahayu et al. (2023) revealed that subjective norm may directly influence a person's optimal decision without necessarily shaping their intentions.

Besides, Gross and Vostroknutov (2022) may automatically comply with social norms without passing through the cognitive process of forming an intention. This automatic response can lead directly to final optimal decision-making, bypassing intention. As a result, final decision is driven by external expectations rather than deliberate personal choice, making intention unnecessary in the process of decision-making. Therefore, it is concluded that intention to make optimal decisions for purchasing life insurance does not mediate the relationship between subjective norm and optimal decisions of life insurance purchasing behaviour.

4.9.2.3 Hypothesis 2c

H_{2c}: Intention to make optimal decisions for purchasing life insurance mediates the relationship between perceived behavioural control and optimal decisions of life insurance purchasing behaviour.

This finding supports H_{2c}, indicating that intention to make optimal decisions for purchasing life insurance partially mediates the relationship between perceived behavioural control and optimal decisions of life insurance purchasing behaviour. TPB is adequate to explain how intention to make optimal decisions for purchasing life insurance mediates the relationship between perceived behavioural control and optimal decisions of life insurance purchasing behaviour. Individuals with higher perceived behavioural control are more confident in their ability to evaluate policy options and manage financial commitments, which strengthens their intention to make optimal decisions for purchasing life insurance. When such intentions are formed, they are more likely to translate into actual optimal decisions of life insurance purchasing behaviour, as individuals feel capable of performing their planned actions within their perceived control boundaries.

This finding can be explained using expected utility theory (Bernoulli, 1990; Hou, 2025). Expected utility theory stated that individuals make rational decisions under

uncertainty by comparing the expected utilities of alternative options and selecting the one that maximises their overall satisfaction. In the context of life insurance, individuals evaluate the trade-off between the cost of premiums and the expected benefits of financial protection. Those with high perceived behavioural control are more capable of assessing risks, probabilities, and potential outcomes, which enhances their ability to maximise expected utility when making life insurance decisions. This perceived control also strengthens their intention to make optimal decisions for purchasing life insurance, as they anticipate greater overall satisfaction and reduced uncertainty from acting rationally.

This finding aligns with the study by Sultan et al. (2020), which showed that intention partially mediates the relationship between PBC and the final optimal decision, highlighting how intention acts as a bridge between PBC and actual decision. However, since it is a partial mediation, PBC also directly influences the actual decision independently, meaning that both the sense of control and the formed intention contribute to the final optimal decision.

Besides, Mafabi et al. (2017) also indicated a significant relationship between PBC and actual behaviour through the full mediating role of behavioural intention through SEM approach. This indirect relationship suggests that behavioural intention serves as a necessary mediator linking PBC to the final decision, highlighting the importance of intention in achieving optimal decision-making outcomes.

In contrast, Suleman et al. (2021) found that intention does not mediate the relationship between PBC and physical well-being. They collected data from 315 Pakistani Muslims and non-Muslims respondents using a convenience sampling method and analysed data with PLS-SEM technique. This finding suggests that in certain field, such as physical well-being, optimal decision-making may bypass the mediating role of intention, relying more directly on the influence of PBC. It is similar to the study of Alfiero et al. (2022) who stated that intention did not significantly mediate the relationship between PBC and purchasing decisions, indicating that the pathway from PBC to optimal decisions might not always operate through intention.

Therefore, based on the discussion above, it can be inferred that intention to make optimal decisions for purchasing life insurance partially mediates the relationship between perceived behavioural control and optimal decisions of life insurance purchasing behaviour.

4.9.2.4 Hypothesis 2d

H_{2d}: Intention to make optimal decisions for purchasing life insurance mediates the relationship between financial literacy and optimal decisions of life insurance purchasing behaviour.

This finding supports H_{2d}, indicating that intention to make optimal decisions for purchasing life insurance partially mediates the relationship between financial literacy and optimal decisions of life insurance purchasing behaviour. TPB is sufficient to explain how intention to make optimal decisions for purchasing life insurance mediates the relationship between financial literacy and optimal decisions of life insurance purchasing behaviour. Within the extended framework of TPB, individuals with higher level of financial literacy possess more comprehensive knowledge and understanding of insurance products, associated risks, and financial outcomes. Such knowledge fosters more favourable attitudes towards life insurance and enhances individuals' confidence in their decision-making capabilities. This increased competence and perceived control strengthen their intention to make optimal decisions, which subsequently translates into actual optimal decisions of life insurance purchasing behaviour. Therefore, financial literacy influences optimal decisions of life insurance purchasing behaviour indirectly through its positive effect on intention, consistent with the mediating mechanism proposed in the extended TPB framework.

The partial mediating role of intention between financial literacy and optimal decisions of life insurance purchasing behaviour can be explained using human capital theory (Becker, 1975; Agarwal, 2022). Human capital theory posits that individuals invest in education, training, and knowledge to enhance their cognitive and analytical capacities, which subsequently improve their economic decision-making and productivity. In the context of life insurance, financial literacy functions as a form of human capital that enables individuals to better understand life insurance products, evaluate risks, and anticipate long-term benefits. However, possessing financial knowledge alone is insufficient to guarantee optimal decisions of life insurance purchasing behaviour; individuals must also develop a deliberate intention to apply that knowledge when making optimal decisions regarding life insurance. Therefore, intention acts as a partial mediator, as financial literacy can influence actual optimal decisions of life insurance purchasing behaviour directly and indirectly by strengthening the intention to make optimal decisions.

This finding is consistent with Peiris (2021) who revealed that the intention to save partially mediates the relationship between FL and saving decisions. This highlights that optimal decision-making in financial contexts often requires the interplay of knowledge (financial literacy) and deliberate intention, as intention serves as a crucial link in translating knowledge into effective decisions. Additionally, the direct and significant influence of FL on saving decisions indicates that knowledgeable individuals are more capable of making optimal financial decisions and effectively managing short-term expenses while planning for future financial stability.

Besides, Widjaja et al. (2020) also revealed that FL influences saving decisions effectively both directly and indirectly through the mediating role of intention. They further stated that a positive attitude towards a certain product or service can be enhanced by the knowledge and understanding that risks can be controlled and minimised, thereby contributing to more informed and optimal decision-making.

In contrast, Wahyuni and Hafiz (2023) discovered that behavioural intention does not mediate the effect of FL on financial management decision among undergraduate students in North Sumatra, Indonesia. It means that FL may have a direct influence on financial management behaviour, bypassing the need for intention as a mediating role. Thus, based on the discussions above, this study is deduced that the intention to make optimal decisions for purchasing life insurance partially mediates the relationship between financial literacy and optimal decisions of life insurance purchasing behaviour.

4.9.2.5 Hypothesis 2e

H_{2e}: Intention to make optimal decisions for purchasing life insurance mediates the relationship between perceived risk and optimal decisions of life insurance purchasing behaviour.

This finding does not support H_{2e}, indicating that the intention to make optimal decisions for purchasing life insurance does not mediate the relationship between perceived risk and optimal decisions of life insurance purchasing behaviour. It is contrasted to Masud et al. (2021) who discovered that behavioural intention has a partial mediating effect for the relationship between perceived risk and purchase decisions. TPB is not able to explain how intention to make optimal decisions for purchasing life insurance mediates the relationship between perceived risk and optimal decisions of life insurance purchasing behaviour. Within

the extended framework of TPB, individuals who perceive high levels of financial or outcome-related risk tend to rely more on emotional responses such as fear and uncertainty rather than on rational, intentional planning. Consequently, their decision-making processes may bypass the formation of deliberate intention, leading perceived risk to exert a more direct influence on actual optimal decisions of life insurance purchasing behaviour.

This finding can also be interpreted using expected utility theory (Bernoulli, 1990; Bales, 2025), which suggests that individuals evaluate alternatives by weighing potential outcomes under conditions of risk and uncertainty. When perceived risk is high, decision-making tends to rely on direct assessments of potential losses and gains rather than on deliberate intention formation. Consequently, individuals act to maximise expected utility or minimise loss, causing perceived risk to influence optimal decisions of life insurance purchasing behaviour directly rather than through intention.

Besides, this relationship may occur in this study due to weak intention formation. It is supported by Tanveer et al. (2021) who discovered that high PR can negatively cause individuals to struggle with forming a clear intention to make an optimal decision. The uncertainty and fear might prevent them from committing to a course of action, thereby weakening the mediation effect of intention.

In addition, Hodgkinson et al. (2023) also found that consumers often rely on mental shortcuts or heuristics to make decisions immediately in high-risk situations. The mental shortcuts or heuristics allow them to bypass the slower and thoughtful process of forming intentions, prioritising rapid action over intentional thought. As a result, their final decisions are driven by immediate perceptions of risk rather than cautious intention-setting. Therefore, it is concluded that the intention to make optimal decisions for purchasing life insurance does not mediate the relationship between perceived risk and optimal decisions of life insurance purchasing behaviour.

4.9.3 Research Objective 3

4.9.3.1 Hypothesis 3

H₃: The positive relationship between the intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour is stronger for lower hyperbolic discounting.

This finding does not support H₃. This study reveals that the positive relationship between the intention to make optimal decisions for purchasing life insurance and actual optimal decisions of life insurance purchasing behaviour does not become stronger when hyperbolic discounting is lower. Hyperbolic discounting model from behavioural economics is not adequate to explain how hyperbolic discounting moderates the relationship between intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour. Traditionally, this model suggests that individuals with stronger present bias tend to undervalue future rewards, leading to procrastination and suboptimal long-term financial decisions. However, in the context of life insurance, the decision does not solely yield future benefits but also provides immediate psychological utility, such as peace of mind, reduced anxiety, and the fulfilment of social responsibility. For individuals exhibiting present bias, these immediate emotional rewards can outweigh the disutility of paying premiums, thereby reinforcing rather than weakening the translation of intention into actual optimal decisions of life insurance purchasing behaviour. This suggests that the conventional hyperbolic discounting model may underestimate the role of immediate psychological satisfaction in motivating optimal decisions regarding life insurance (Rehman & Bhavani, 2025).

This finding aligns with Dutu (2020), showing that unstable economic conditions such as the COVID-19 pandemic could strengthen the positive relationship between intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour, even for individuals with higher hyperbolic discounting. Economic instability can increase awareness of future risks, prompting individuals to act more cautiously and follow through on intentions to make optimal choices. This shift may reduce the influence of present bias, allowing for more deliberate and future-oriented decisions.

Besides, Grishchenko (2019) indicated that the unemployment rate increases future financial insecurity, encouraging individuals to focus more on financial security products such as insurance due to heightened uncertainty and financial pressure, even for consumers with higher hyperbolic discounting. In such cases, the urgency of securing future stability may override their usual preference for immediate rewards, prompting more cautious, optimal and long-term decisions. This demonstrates how external factors, like unemployment, can influence even those with strong present biases to act more intentionally.

The finding of this study is contrasted with Ikeda and Kang (2015) who discovered that higher hyperbolic discounting reflects a stronger present bias, causing individuals to prioritise immediate consumption over future savings and investments, leading to lower wealth accumulation. Stronger present bias can result in under-saving, delayed stock market participation, and suboptimal investment decisions, as hyperbolic discounters are less likely to pay the costs of early investment. Self-control issues further worsen the gap between intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour, as the desire for immediate gratification often ignores long-term financial goals. Overall, these tendencies weaken the relationship between intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour, resulting in inefficient saving and investing practices.

Ikeda and Ikeda (2016) also revealed that higher hyperbolic discounting increases procrastination and reduces commitment to intentions, making individuals find it difficult to follow through on long-term plans, resulting in a weakened relationship between intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour. Consequently, individuals may struggle to make decisions that align with their long-term interests, resulting in suboptimal outcomes. The present bias introduced by hyperbolic discounting disrupts their ability to act on intentions, despite having clear objectives. Therefore, based on the discussion above, it is concluded that the positive relationship between the intention to make optimal decisions for purchasing life insurance and actual optimal decisions of life insurance purchasing behaviour does not become stronger when hyperbolic discounting is lower.

CHAPTER 5:

CONCLUSIONS

5.1 Introduction

This chapter summarises the key findings of the study, offering a detailed overview of the results. This chapter also addresses the limitations of the study, acknowledging areas where further research is needed. Theoretical and practical implications are then presented, followed by concluding remarks.

5.2 Summary of the Results

This study utilised an online survey to address the research objectives. The collected data was employed to evaluate both the measurement and structural models through SmartPLS. The Cronbach's alpha and composite reliability values exceed the minimum acceptable threshold of 0.7, demonstrating that the measurement model has satisfactory internal consistency reliability. For indicator reliability, all loading values are greater than 0.7, except for ATT1 and FL1, which have satisfactory indicator reliability in this study. Convergent validity was determined through AVE, with the values above 0.5, providing sufficient convergent validity in the measurement model. Additionally, discriminant validity was assessed using cross loadings, the Fornell-Larcker criterion, and HTMT. The results show higher indicator loadings on assigned latent variables, AVE square roots of each construct exceeding correlations with other constructs, and HTMT values below 0.85, indicating no issues with discriminant validity.

After establishing the measurement model, the analysis moved forward to evaluate the structural model, which investigated the relationships among latent variables to meet research objectives. The results indicate a significant effect of subjective norm, perceived

behavioural control, financial literacy, and perceived risk on optimal decisions of life insurance purchasing behaviour, as 0 does not straddle within the bias-corrected confidence intervals. However, the result does not show a significant effect of attitude towards life insurance on optimal decisions of life insurance purchasing behaviour as 0 straddles within the bias-corrected confidence intervals. Additionally, bootstrapping results are discovered to have a t -value > 2.33 , thus the significance level at 0.01 for subjective norm, perceived behavioural control, and perceived risk, and financial literacy is significant at the 0.05 level, as its t -value > 1.645 . However, attitude towards life insurance exceeds the significance level of 0.05, indicating that attitude towards life insurance does not have a statistically significant effect on optimal decisions of life insurance purchasing behaviour. Since the values of the path coefficient for subjective norm, perceived behavioural control, and financial literacy are positive, subjective norm, perceived behavioural control, and financial literacy have positive impacts on optimal decisions of life insurance purchasing behaviour. Conversely, the path coefficient's value of perceived risk is negative, revealing that perceived risk negatively influences optimal decisions of life insurance purchasing behaviour. Thus, H_{1b}, H_{1c}, H_{1d}, and H_{1e} are supported in this study, whereas H_{1a} is not supported in this study.

Besides, the indirect effects of bias-corrected confidence intervals do not straddle a 0 in between, indicating there is a mediating role of intention to make optimal decisions for purchasing life insurance for the relationships between attitude towards life insurance, perceived behavioural control, financial literacy, and optimal decisions of life insurance purchasing behaviour. However, there is no mediating role of intention to make optimal decisions for purchasing life insurance for the relationships between subjective norm, perceived risk, and optimal decisions of life insurance purchasing behaviour as their bias-corrected confidence intervals straddle a 0 in between. For the cutoff value for the mediation analysis is 1.645 ($\alpha=0.10$) for a two-tailed test, the significant mediating role of intention to make optimal decisions exists for the relationships between attitude towards life insurance, perceived behavioural control, financial literacy, and optimal decisions of life insurance purchasing behaviour. Therefore, H_{2a}, H_{2c}, and H_{2d} are supported, whereas H_{2b} and H_{2e} are not supported in this study.

The interaction term of HD $\times$ INT $\rightarrow$ OD is significant ($t=1.763$, $p=0.039$), exceeding the cutoff value of 1.645 ($\alpha=0.05$) for a one-tailed test. However, the interaction plot

indicates that the positive relationship between intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour is stronger when hyperbolic discounting is higher, which contrasts with H₃. Therefore, H₃ is not supported, stating that hyperbolic discounting does not exhibit a moderating effect on the relationship between intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour.

5.3 Limitations of the Study

Some limitations are recognised in this study. Firstly, online data collection may not fully represent the broader population, as it primarily captures respondents who are comfortable with digital platforms, potentially excluding less technologically savvy individuals (Grewenig et al., 2023). This can restrict the generalisability of the findings to the entire population, particularly in regions with uneven digital access.

Besides, this study relies solely on the quantitative survey, which may not capture the full complexity of optimal decisions of life insurance purchasing behaviour (Dawadi et al., 2021). As the quantitative survey primarily focuses on numerical data, it may not fully capture the qualitative insights, opinions, and personal experiences that explain how and why individuals behave in certain ways.

Moreover, the study primarily focuses on the mediating role of intention, which may ignore other influential mediators that could explain the relationship between predictors and optimal decisions of life insurance purchasing behaviour.

In addition, the cross-sectional design limits the ability to observe how hyperbolic discounting influences the relationship between intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour over time in this study, which is in line with Peviani et al. (2024).

Lastly, the study's sample focused on customers within the Malaysian market. Although Malaysia provides a relevant context for investigating optimal decisions of life insurance purchasing behaviour, the findings may not be generalisable to other countries, due to cultural, religious, and economic differences. Malaysian consumers' decision-making is often shaped by collectivist social norms (Chong et al., 2025) and a comparatively low

life insurance penetration rate (GlobalData, 2024). These contextual characteristics may result in behavioural patterns distinct from those observed in Western or other developed markets.

5.4 Recommendations for Future Studies

This study offers recommendations for future research accordingly. Firstly, it is recommended to employ a combination of both online and offline data collection techniques. By incorporating telephone interviews, face-to-face surveys, or paper-based questionnaires, researchers can reach a more diverse and representative sample, including those who may not be as comfortable with or have access to digital platforms.

In addition, mixed-method techniques, which integrate quantitative approaches with qualitative methods, should be considered (Shackleton et al., 2021; Keskin, 2025). Qualitative methods would enable a deeper understanding of the complex phenomena surrounding optimal decisions of life insurance purchasing behaviour, allowing the exploration of participants' perspectives and providing contextual understanding through non-numerical data, such as interviews. These insights could highlight the underlying motivations, cognitive processes, and contextual factors that influence optimal decisions of life insurance purchasing behaviour, which may not be fully captured through the quantitative approach alone.

Besides the mediating role of intention, other significant variables may also serve as mediators within the research framework. For instance, trust (Permana et al., 2025; Rahayu et al., 2025), convenience (Shaw & Eschenbrenner, 2025), and self-efficacy (Anwar et al., 2021; Maheshwari & Kha, 2022) have been identified as potential mediating variables in related studies. Incorporating these mediating variables can offer a clearer understanding of optimal decisions of life insurance purchasing behaviour and improve the study's overall model.

To gain a more comprehensive understanding of how time preferences interact with optimal decision-making processes, a longitudinal approach is recommended. This method would offer deeper insights into how hyperbolic discounting acts as a moderator over different periods, providing a more nuanced view of its impact on optimal decision-making.

Future research should extend the sample to include participants from multiple countries. Cross-cultural comparisons would help determine whether the observed relationships hold across different economic and cultural contexts. Such efforts would enhance the generalisability and robustness of the findings.

5.5 Implications

5.5.1 Theoretical Implications

This study provides a significant contribution to the theoretical framework of optimal decisions, especially within the Malaysian context, where research on this topic has been relatively limited. This study contributes to the existing literature by offering a deeper understanding of optimal decisions of life insurance purchasing behaviour through the integration of TPB with the hyperbolic discounting model. By examining the significant direct effects of subjective norm, perceived behavioural control, financial literacy, and perceived risk on optimal decisions of life insurance purchasing behaviour, this study extends the TPB framework and emphasises the importance of internal factors in shaping optimal decision-making.

Besides, the partial mediation of intention to make optimal decisions for purchasing life insurance between perceived behavioural control, financial literacy, and optimal decisions of life insurance purchasing behaviour, as discovered in this study, also offers significant theoretical insights. This highlights the pivotal role of intention to make optimal decisions for purchasing life insurance as a mediator for the relationships of perceived behavioural control, financial literacy, and optimal decisions of life insurance purchasing behaviour within the TPB framework, suggesting that the direct influence of perceived behavioural control and financial literacy alone are insufficient to explain optimal decisions of life insurance purchasing behaviour.

Furthermore, the finding that intention to make optimal decisions for purchasing life insurance fully mediates the relationship between attitude towards life insurance and optimal decisions of life insurance purchasing behaviour highlights the critical role of intention in translating attitude towards life insurance into optimal decisions of life insurance purchasing behaviour. It indicates that attitude towards life insurance alone does not directly lead to

optimal decisions of life insurance purchasing behaviour, thus, the formation of a strong intention is necessary to translate attitude towards life insurance into actual optimal decisions of life insurance purchasing behaviour. This suggests that even individuals with positive attitude may fail to make optimal decisions of life insurance purchasing behaviour if they do not develop a clear intention. Therefore, theoretical models must account for the mediating role of intention to make optimal decisions for purchasing life insurance in bridging the gap between attitude towards life insurance and actual optimal decisions of life insurance purchasing behaviour.

In addition, this study also challenges traditional assumptions about the influence of hyperbolic discounting on optimal decisions of life insurance purchasing behaviour. In contrast to assumptions, this study discovers that hyperbolic discounting does not significantly moderate the relationship between intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour, suggesting that time preferences may not be as impactful as previous literature suggests. This finding suggests that other psychological factors such as risk aversion and trust, should be considered to better explain the gap between intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour.

5.5.2 Practical Implications

This study provides several practical implications within the insurance market in Malaysia. Insurance companies should design targeted campaigns in multiple languages (Malay, Mandarin, Tamil, and English) to accommodate Malaysia's cultural diversity and enhance public awareness of life insurance as a socially responsible financial practice. They should also introduce user-friendly digital tools, such as mobile applications for policy comparisons and premium calculations, to increase accessibility among tech-savvy urban consumers while maintaining physical insurance counselling centres for less digitally inclined segments. These initiatives would improve consumer knowledge, reduce decision-making uncertainty, and build confidence in selecting policies, thereby promoting more informed and optimal decisions regarding life insurance.

Besides, insurance policymakers should establish clear regulatory guidelines to adopt standardised policy disclosure formats. These formats should include simplified terms, clear comparisons of benefits and premiums, and concise explanations of policy exclusions to

ensure transparency and reduce consumers' perceived risk. Such measures would reduce information asymmetry, helping consumers make optimal decisions without being misled by complex or technical language.

Moreover, the government could implement tax deductions for life insurance premiums to incentivise greater participation, particularly among middle-income earners who may perceive insurance as a discretionary expense. For lower-income households, targeted subsidies or micro-insurance schemes could be introduced to improve affordability, ensuring broader access to financial protection.

Furthermore, the health sector can collaborate with insurance companies to introduce integrated health and life insurance packages that reward preventive healthcare activities, such as regular check-ups, healthy lifestyle practices, and participation in wellness campaigns. These incentives not only encourage individuals to take proactive measures in maintaining their health but also provide financial benefits, such as premium discounts or additional coverage, thereby increasing the perceived value of insurance products and motivating consumers to make more informed and optimal decisions when selecting coverage.

Finally, collaborative efforts among government agencies, insurance companies, and healthcare providers are essential to enhance affordability, transparency, and product innovation in Malaysia's insurance market, ensuring households are better equipped to make informed and optimal financial decisions.

5.6 A Remark

This study integrated TPB with the hyperbolic discounting model to better understand optimal decisions of life insurance purchasing behaviour. The results reveal that subjective norm, perceived behavioural control, financial literacy, and perceived risk significantly influence optimal decisions of life insurance purchasing behaviour, whereas attitude towards life insurance does not show a significant effect on optimal decisions of life insurance purchasing behaviour. Furthermore, intention to make optimal decisions for purchasing life insurance mediates the relationships between attitude towards life insurance, perceived behavioural control, financial literacy, and optimal decisions of life insurance purchasing behaviour, emphasising the importance of intention in optimal decision-making.

However, contrary to assumptions, hyperbolic discounting does not moderate the relationship between intention to make optimal decisions for purchasing life insurance and optimal decisions of life insurance purchasing behaviour. These findings highlight the need for future research, particularly using a longitudinal approach, to better understand how hyperbolic discounting might influence optimal decisions of life insurance purchasing behaviour over time and to explore other potential mediators and moderators that can further refine the model of optimal decisions of life insurance purchasing behaviour.

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APPENDICES

Appendix A: A Final Survey

Greetings,

Dear Sir/Mdm,

I am respectfully seeking your assistance for my PhD research project, which I am currently pursuing at University of Malaysia, Sarawak (UNIMAS) located in Kota Samarahan, Sarawak. The aim of conducting my research is to investigate the moderating effect of hyperbolic discounting towards the optimal decisions of life insurance purchasing behaviour and examine the influences of attitude, subjective norm, perceived behavioural control, financial literacy, and perceived risk on the optimal decisions of life insurance purchasing behaviour through the mediating role of intention. This study focuses on Malaysian households who experienced in purchasing life insurance. The participants should be 18 years old or above and have some degree of financial stability. It will only take about 15 to 30 minutes to complete this questionnaire.

Participation is voluntary and responses will be kept in anonymous. You have the right not to respond to any questions that you selected. Kindly understand that the participation in this study is voluntary and will not be penalised if you withdraw from this study. Thank you for your valuable time and help to fill this questionnaire. Your willingness to complete this survey is greatly appreciated. If you have any questions, please do not hesitate to contact me via email, 22010007@siswa.unimas.my

Thank you.

Regards,

Gan Jia Wei (PhD Student of Faculty of Economy and Business, UNIMAS)

I have read the above information and agree to participate in this research project. *

☐ Yes

☐ No

SECTION A: DEMOGRAPHIC DATA

Instruction: Please tick (✓) as appropriate in the column given.

1. States and federal territories: *

- ☐ Johor
- ☐ Kedah
- ☐ Kelantan
- ☐ Malacca
- ☐ Negeri Sembilan
- ☐ Pahang
- ☐ Penang
- ☐ Perak
- ☐ Perlis
- ☐ Sabah
- ☐ Sarawak
- ☐ Selangor
- ☐ Terengganu

2. Gender: *

- ☐ Male
- ☐ Female

3. Age: *

- ☐ 18-22 years old
- ☐ 23-27 years old
- ☐ 28-32 years old
- ☐ 33-37 years old
- ☐ 38-42 years old
- ☐ 43-47 years old
- ☐ 48-52 years old
- ☐ 53-57 years old
- ☐ 58 years old and above

4. Race: *

- ☐ Malay
- ☐ Chinese
- ☐ Indian
- ☐ Iban
- ☐ Bidayuh
- ☐ Kadazan
- ☐ Dusun
- ☐ Other...

5. Marital status: *

- ☐ Single
- ☐ Married
- ☐ Widowed
- ☐ Divorced
- ☐ Separated
- ☐ Other...

6. How many children are in the household? *

- ☐ No children
- ☐ 1-2
- ☐ 3-4
- ☐ 5 or more

7. Highest education level: *

- ☐ Primary level
- ☐ Secondary level
- ☐ Pre-university level (STPM/Foundation/Matriculation/Diploma)
- ☐ Undergraduate level (Bachelor's degree)
- ☐ Master's degree level
- ☐ Professional degree level
- ☐ Doctorate degree level

8. Employment status: *

- ☐ Full-time employment
- ☐ Part-time employment
- ☐ Self-employed
- ☐ Housewife
- ☐ Retired
- ☐ Other...

9. Individual monthly income in RM: *

- ☐ Less than RM1500
- ☐ RM1501-RM2500
- ☐ RM2501-RM3500
- ☐ RM3501-RM4500
- ☐ RM4501-RM5500
- ☐ More than RM5501

10. How many life insurance policies does your household currently hold? *

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 or more

11. Which life insurance policies did you buy? (Select all that apply) *

- ☐ Term plan (pays out only if death occurs during the term, no cash value)
- ☐ Endowment plan (pays out upon death or maturity, includes savings)
- ☐ Investment-linked plan (combines insurance with investment options)
- ☐ Whole life insurance (provides lifelong coverage, accumulates cash value)
- ☐ Life annuity plan (provides regular payments for life)
- ☐ Mortgage reducing term assurance (MRTA) (pays off mortgage if death occurs)
- ☐ Supplementary rider(s) (additional benefits added to the main policy)
- ☐ Other...

12. Have you ever made a mistake when deciding on life insurance? *

- ☐ Yes
- ☐ No

13. If yes, please indicate your mistake regarding life insurance decisions. (Select all that apply)

- ☐ Bought too much coverage.
- ☐ Bought too little coverage.
- ☐ Chose the wrong type of policy.
- ☐ Overlooked adding rider(s).
- ☐ Misinterpreted insurance terms.
- ☐ Other...

SECTION B

The items in the questionnaire are used through a 5-point Likert-scale measurement, ranging from "strongly disagree" to "strongly agree". (1= Strongly Disagree; 2= Disagree; 3= Neither Agree Nor Disagree; 4= Agree; 5= Strongly Agree)

Attitude towards life insurance

1. Life insurance policy in my opinion prevents potential financial burden. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

2. Choosing the best life insurance in my opinion protects my loved one. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

3. I feel making optimal decisions regarding life insurance is really good for me. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

4. I feel connected to a community of buyers who value life insurance policies. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

5. I am motivated to make the best decisions regarding life insurance. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

6. I am determined to make the best decisions regarding life insurance. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

Subjective norm

7. My family's opinion of what I should do is important to me. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree *

8. My friends think that I should make the best decisions regarding life insurance.

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

9. People I care about will remind me to buy the best life insurance policy to accumulate wealth. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

10. I am motivated to accept social expectations in selecting the best life insurance policy. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

11. I follow the opinions of family members. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

12. I follow the opinions of friends. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

Perceived behavioural control

13. I have enough sources of information for reference in life insurance policies. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

14. I understand what life insurance is. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

15. I have confidence in selecting the right life insurance policy that meets my needs. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

16. I am in full control of what I do. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

17. I am completely responsible for everything that results from my decisions. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

18. I make decisions from the very beginning to the very end. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

Financial literacy

19. An investment-linked life insurance with a high return rate will have a high-risk rate. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

20. When the inflation rate increases, the cost-of-living increases. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

21. I have a strong belief that the way that I manage my life insurance will affect my future. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

22. It is essential to set financial goals for the future. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

23. I compare the prices of life insurance policies. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

24. I always reach the goals I set when managing my life insurance policy. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

Perceived risk

25. I fear that the life insurance policy I purchased will not meet my expectations. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

26. I fear that the life insurance policy I purchased may not provide benefits. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

27. I worry that the life insurance policy I purchased is not worth the money spent. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

28. I do not think spending money on life insurance is wise. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

29. I feel worried whether my decision regarding life insurance is the right one. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

30. I feel anxious when buying a life insurance policy. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

Intention to make optimal decisions for purchasing life insurance

31. I intend to gather as much information as possible to make the best decisions for life insurance. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

32. I plan to consider the pros and cons of a life insurance policy, aiming for the optimal decisions. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

33. I intend to invest my time in making the best decisions for life insurance. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

34. I intend to understand which insurance products suit me best. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

35. I plan to make the best decisions regarding life insurance to avoid financial burdens. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

36. I intend to buy the best life insurance policy in the future. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

Hyperbolic discounting

37. I would choose to receive an immediate prize of RM100 rather than waiting for RM200 two ^{*} years from now.

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

38. It makes more sense to spend my money now rather than making optimal decisions ^{*} towards life insurance purchases for the future.

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

39. Individuals should have time to enjoy themselves today. ^{*}

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

40. I prefer immediate rewards over rewards that come later in the future although the ^{*} immediate reward is smaller.

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

41. I often exhibit hesitation when considering long-term life insurance products. ^{*}

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

42. I prefer short-term products compared to long-term life insurance products. ^{*}

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

Optimal decisions of life insurance purchasing behaviour

43. I have already gathered as much information as possible to make the best choice for life ^{*} insurance.

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

44. I made the optimal decisions after weighing the pros and cons of life insurance policies. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

45. I spent my time making optimal decisions for life insurance purchases. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

46. I understood which insurance products suit me best. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

47. I made optimal decisions for life insurance purchases to avoid financial burdens. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

48. I bought the best life insurance policy. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree



**Appendix B:
Straight Lining**

	Case Number													
	16	35	48	55	78	112	174	180	228	249	253	270	324	333
ATT1	4	5	3	3	3	3	4	4	2	5	5	4	4	3
ATT2	4	5	3	3	3	3	4	4	2	5	5	4	4	3
ATT3	4	5	3	3	3	3	4	4	2	5	5	4	4	3
ATT4	4	5	3	3	3	3	4	4	2	5	5	4	4	3
ATT5	4	5	3	3	3	3	4	4	2	5	5	4	4	3
ATT6	4	5	3	3	3	3	4	4	2	5	5	4	4	3
SN1	4	5	3	3	3	3	4	4	2	5	5	4	4	3
SN2	4	5	3	3	3	3	4	4	2	5	5	4	4	3
SN3	4	5	3	3	3	3	4	4	2	5	5	4	4	3
SN4	4	5	3	3	3	3	4	4	2	5	5	4	4	3
SN5	4	5	3	3	3	3	4	4	2	5	5	4	4	3
SN6	4	5	3	3	3	3	4	4	2	5	5	4	4	3
PBC1	4	5	3	3	3	3	4	4	2	5	5	4	4	3
PBC2	4	5	3	3	3	3	4	4	2	5	5	4	4	3
PBC3	4	5	3	3	3	3	4	4	2	5	5	4	4	3
PBC4	4	5	3	3	3	3	4	4	2	5	5	4	4	3
PBC5	4	5	3	3	3	3	4	4	2	5	5	4	4	3
PBC6	4	5	3	3	3	3	4	4	2	5	5	4	4	3
FL1	4	5	3	3	3	3	4	4	2	5	5	4	4	3
FL2	4	5	3	3	3	3	4	4	2	5	5	4	4	3
FL3	4	5	3	3	3	3	4	4	2	5	5	4	4	3
FL4	4	5	3	3	3	3	4	4	2	5	5	4	4	3
FL5	4	5	3	3	3	3	4	4	2	5	5	4	4	3
FL6	4	5	3	3	3	3	4	4	2	5	5	4	4	3
PR1	4	5	3	3	3	3	4	4	2	5	5	4	4	3

PR2	4	5	3	3	3	3	4	4	2	5	5	4	4	3
PR3	4	5	3	3	3	3	4	4	2	5	5	4	4	3
PR4	4	5	3	3	3	3	4	4	2	5	5	4	4	3
PR5	4	5	3	3	3	3	4	4	2	5	5	4	4	3
PR6	4	5	3	3	3	3	4	4	2	5	5	4	4	3
INT1	4	5	3	3	3	3	4	4	2	5	5	4	4	3
INT2	4	5	3	3	3	3	4	4	2	5	5	4	4	3
INT3	4	5	3	3	3	3	4	4	2	5	5	4	4	3
INT4	4	5	3	3	3	3	4	4	2	5	5	4	4	3
INT5	4	5	3	3	3	3	4	4	2	5	5	4	4	3
INT6	4	5	3	3	3	3	4	4	2	5	5	4	4	3
HD1	4	5	3	3	3	3	4	4	2	5	5	4	4	3
HD2	4	5	3	3	3	3	4	4	2	5	5	4	4	3
HD3	4	5	3	3	3	3	4	4	2	5	5	4	4	3
HD4	4	5	3	3	3	3	4	4	2	5	5	4	4	3
HD5	4	5	3	3	3	3	4	4	2	5	5	4	4	3
HD6	4	5	3	3	3	3	4	4	2	5	5	4	4	3
OD1	4	5	3	3	3	3	4	4	2	5	5	4	4	3
OD2	4	5	3	3	3	3	4	4	2	5	5	4	4	3
OD3	4	5	3	3	3	3	4	4	2	5	5	4	4	3
OD4	4	5	3	3	3	3	4	4	2	5	5	4	4	3
OD5	4	5	3	3	3	3	4	4	2	5	5	4	4	3
OD6	4	5	3	3	3	3	4	4	2	5	5	4	4	3

Appendix C: Mahalanobis Distance Output

Descriptives		Statistic	Std. Error
Mahalanobis Distance	Mean	6.9782609	.30416158
	95% Confidence Interval for Lower Bound	6.3798589	
	Mean Upper Bound	7.5766628	
	5% Trimmed Mean	6.3592862	
	Median	5.5851248	
	Variance	29.790	
	Std. Deviation	5.45798443	
	Minimum	.11693	
	Maximum	35.48911	
	Range	35.37219	
	Interquartile Range	5.33555	
	Skewness	2.116	.136
	Kurtosis	6.153	.271

Mahalanobis Distance Stem-and-Leaf Plot

Frequency	Stem &	Leaf
5.00	0 .	12577
29.00	1 .	00122223333344444556667888999
34.00	2 .	000011222344456666677778888899999
30.00	3 .	01111111223345666667777889999
41.00	4 .	0000011111122223344455666677777888999999
42.00	5 .	0011112222334444455555666666777788899999
23.00	6 .	00111222223334445789999
22.00	7 .	1111111122245556677899
19.00	8 .	0112233445566777899
13.00	9 .	0002234445669
13.00	10 .	0112455667889
10.00	11 .	1123445567
5.00	12 .	12358
10.00	13 .	0112456779
1.00	14 .	9
5.00	15 .	56667
2.00	16 .	45
18.00	Extremes	(>=16.8)

Stem width: 1.00000
Each leaf: 1 case(s)

Appendix D:
Mardia's (1974) Table

MEASURES OF MULTIVARIATE SKEWNESS AND KURTOSIS
CRITICAL VALUES OF $b_{1,2}$

n	$\alpha \rightarrow 0.001$	0.01	0.025	0.05	0.075	0.10
10	6.994	5.194	4.294	3.694	3.263	2.994
12	6.744	4.938	3.931	3.319	2.944	2.681
14	6.419	4.581	3.619	3.031	2.669	2.419
16	6.062	4.231	3.337	2.775	2.444	2.219
18	5.737	3.962	3.100	2.556	2.256	2.050
20	5.425	3.669	2.881	2.356	2.081	1.894
25	4.719	3.106	2.438	1.969	1.744	1.581
30	4.238	2.681	2.094	1.687	1.513	1.363
40	3.369	2.087	1.606	1.319	1.181	1.050
50	2.706	1.744	1.306	1.069	0.969	0.862
60	2.200	1.444	1.094	0.906	0.819	0.731
70	1.863	1.244	0.937	0.794	0.725	0.631
80	1.587	1.056	0.812	0.694	0.637	0.544
90	1.400	0.919	0.725	0.638	0.569	0.487
100	1.231	0.831	0.656	0.581	0.506	0.438
150	0.794	0.531	0.444	0.400	0.344	0.281
200	0.569	0.394	0.331	0.300	0.269	0.219
300	0.369	0.256	0.225	0.209	0.169	0.144
400	0.275	0.197	0.166	0.141	0.129	0.116
600	0.183	0.131	0.110	0.094	0.085	0.077
800	0.137	0.099	0.083	0.071	0.064	0.058
1000	0.110	0.079	0.066	0.057	0.051	0.046
1500	0.074	0.053	0.044	0.038	0.034	0.031
2500	0.044	0.032	0.027	0.023	0.021	0.019
3000	0.037	0.027	0.022	0.019	0.017	0.016
4000	0.028	0.020	0.017	0.014	0.013	0.012
5000	0.022	0.016	0.013	0.011	0.010	0.009

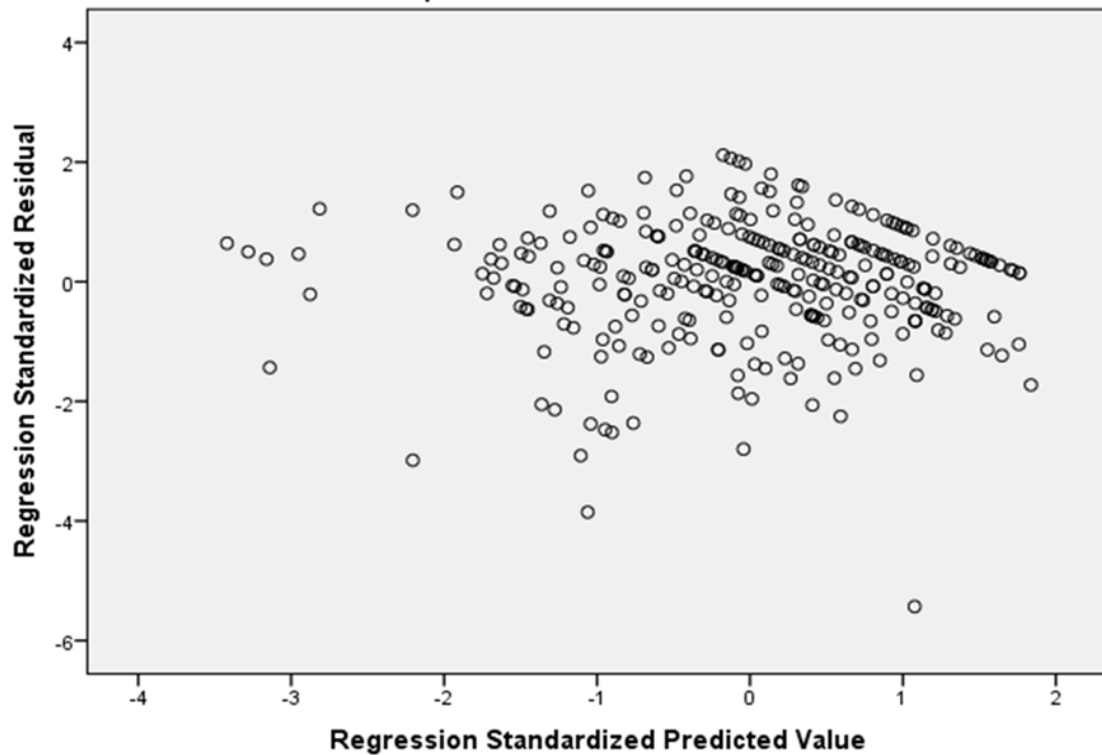
CRITICAL VALUES OF $b_{2,2^+}$

$n \quad 2x$	0.01		0.025		0.05		0.10	
$\rightarrow$	lower	upper	Lower	Upper	lower	upper	lower	Upper
10	4.580	10.378	4.722	9.781	4.887	9.203	5.057	8.606
12	4.732	10.881	4.899	10.150	5.053	9.593	5.232	8.947
14	4.842	11.159	5.015	10.375	5.179	9.769	5.358	9.162
16	4.977	11.387	5.149	10.562	5.318	9.941	5.482	9.331
18	5.045	11.478	5.219	10.628	5.382	10.005	5.555	9.403
20	5.175	11.609	5.262	10.691	5.533	10.114	5.717	9.469
25	5.351	11.628	5.525	10.584	5.689	10.159	5.871	9.503
30	5.518	11.594	5.692	10.556	5.855	10.156	6.038	9.516
40	5.703	11.453	5.871	10.563	6.139	10.109	6.229	9.497
50	5.909	11.181	6.083	10.372	6.239	9.987	6.403	9.453
60	6.015	10.994	6.189	10.250	6.335	9.889	6.505	9.401
70	6.139	10.753	6.290	10.106	6.437	9.781	6.602	9.356
80	6.223	10.537	6.372	9.981	6.539	9.694	6.683	9.309
90	6.332	10.325	6.475	9.885	6.622	9.688	6.749	9.256
100	6.389	10.188	6.521	9.806	6.665	9.556	6.793	9.210
150	6.615	10.253	6.749	9.475	6.858	9.300	6.972	9.027
200	6.761	9.506	6.889	9.269	6.979	9.141	7.083	8.919
300	6.949	9.219	7.052	9.031	7.142	8.916	7.245	8.766
400	7.079	9.061	7.171	8.917	7.252	8.787	7.342	8.664
600	7.232	8.874	7.295	8.749	7.369	8.647	7.464	8.547
800	7.304	8.747	7.372	8.641	7.451	8.562	7.536	8.472
1000	7.367	8.656	7.433	8.569	7.504	8.497	7.585	8.419
1500	7.460	8.532	7.537	8.463	7.595	8.405	7.661	8.339
2000	7.535	8.461	7.599	8.401	7.649	8.351	7.707	8.293
2500	7.588	8.412	7.641	8.359	7.686	8.314	7.738	8.262
3000	7.624	8.376	7.673	8.327	7.714	8.286	7.760	8.240
4000	7.674	8.326	7.716	8.284	7.752	8.248	7.793	8.207
5000	7.709	8.291	7.746	8.254	7.778	8.222	7.814	8.186

Appendix E: Homoscedasticity

Scatterplot

Dependent Variable: OD



BREUSCH-PAGAN TEST

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.192 ^a	.037	.014	.70477

a. Predictors: (Constant), HD, FL, SN, INT, PR, PBC, ATT

b. Dependent Variable: res_squared

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.604	7	.801	1.612	.132 ^b
	Residual	147.022	296	.497		
	Total	152.626	303			

a. Dependent Variable: res_squared

b. Predictors: (Constant), HD, FL, SN, INT, PR, PBC, ATT

Appendix F: Durbin Watson Test

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.718 ^a	.515	.504	.55792	.515	44.912	7	296	.000	1.789

a. Predictors: (Constant), HD, FL, SN, INT, PR, PBC, ATT

b. Dependent Variable: OD

Appendix G: Independent Samples T-Test

Group Statistics

respondents		N	Mean	Std. Deviation	Std. Error Mean
ATT	Early respondents	85	4.1922	.57015	.06184
	Late respondents	85	4.1294	.60879	.06603
SN	Early respondents	85	4.0353	.63937	.06935
	Late respondents	85	3.9765	.72244	.07836
PBC	Early respondents	85	4.1098	.66446	.07207
	Late respondents	85	4.1373	.67758	.07349
FL	Early respondents	85	4.2137	.53737	.05829
	Late respondents	85	4.1824	.64582	.07005
PR	Early respondents	85	3.1275	1.13116	.12269
	Late respondents	85	3.0373	1.02752	.11145
INT	Early respondents	85	4.2137	.67043	.07272
	Late respondents	85	4.2863	.52176	.05659
HD	Early respondents	85	3.0824	1.04452	.11329
	Late respondents	85	2.9627	.92952	.10082
OD	Early respondents	85	3.8843	.81812	.08874
	Late respondents	85	4.0412	.77233	.08377

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
ATT	Equal variances assumed	.119	.731	.694	168	.489	.06275	.09047	-.11586	.24135
	Equal variances not assumed			.694	167.283	.489	.06275	.09047	-.11586	.24135
SN	Equal variances assumed	1.327	.251	.562	168	.575	.05882	.10464	-.14776	.26540
	Equal variances not assumed			.562	165.554	.575	.05882	.10464	-.14778	.26543
PBC	Equal variances assumed	.037	.848	-.267	168	.790	-.02745	.10293	-.23066	.17576
	Equal variances not assumed			-.267	167.936	.790	-.02745	.10293	-.23066	.17576
FL	Equal variances assumed	2.956	.087	.344	168	.731	.03137	.09113	-.14853	.21127
	Equal variances not assumed			.344	162.626	.731	.03137	.09113	-.14857	.21132
PR	Equal variances assumed	1.497	.223	.544	168	.587	.09020	.16575	-.23703	.41743
	Equal variances not assumed			.544	166.472	.587	.09020	.16575	-.23706	.41745
INT	Equal variances assumed	3.508	.063	-.787	168	.432	-.07255	.09214	-.25446	.10936
	Equal variances not assumed			-.787	158.443	.432	-.07255	.09214	-.25454	.10944
HD	Equal variances assumed	1.577	.211	.789	168	.431	.11961	.15166	-.17979	.41901
	Equal variances not assumed			.789	165.765	.431	.11961	.15166	-.17982	.41904
OD	Equal variances assumed	.173	.678	-1.285	168	.200	-.15686	.12203	-.39778	.08405
	Equal variances not assumed			-1.285	167.446	.200	-.15686	.12203	-.39778	.08406

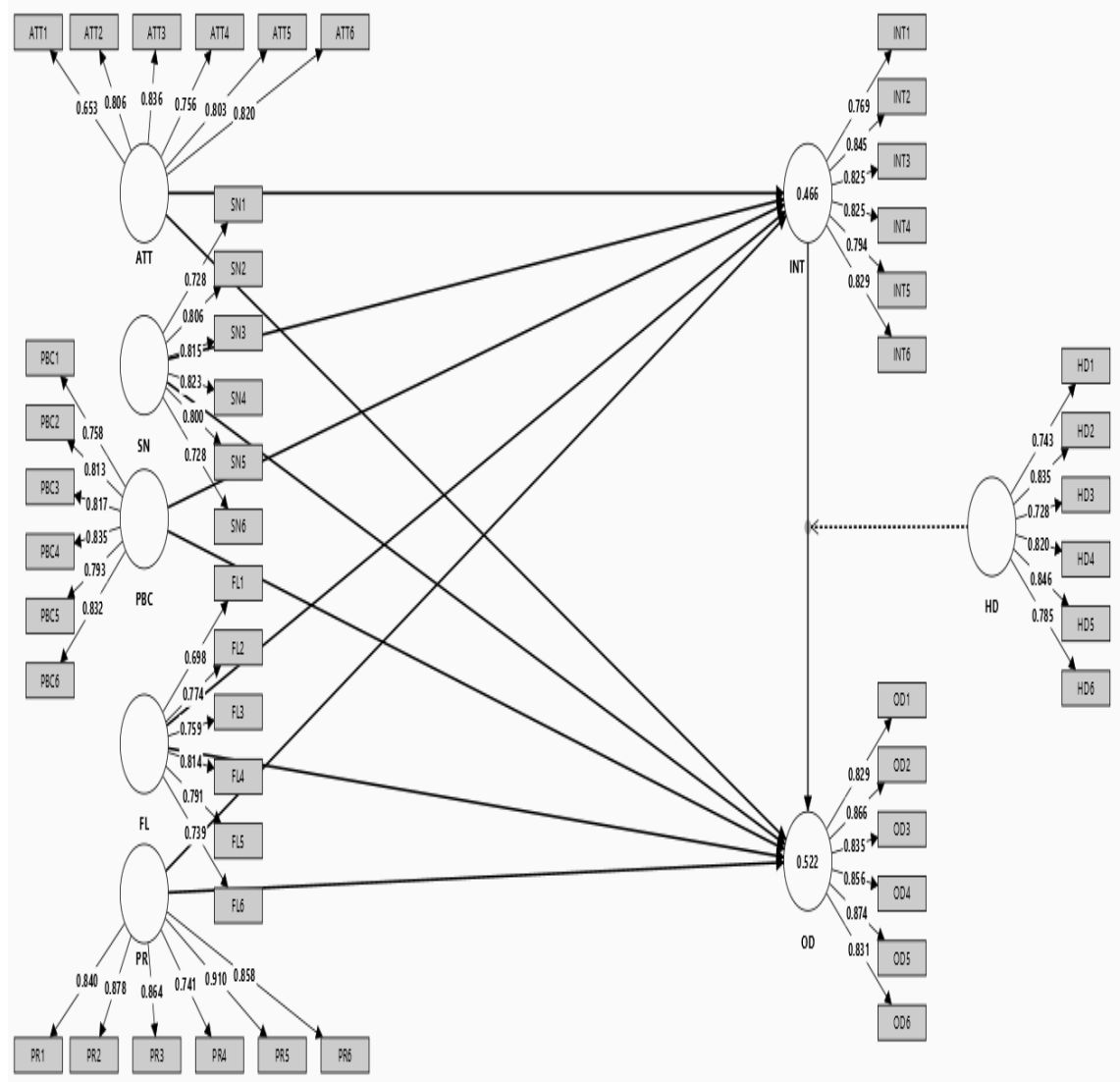
**Appendix H:
Outer Loadings**

Constructs	Items	Loadings	Remarks
Attitude towards life insurance	ATT1	0.653	ATT1 is removed.
	ATT2	0.806	
	ATT3	0.836	
	ATT4	0.756	
	ATT5	0.803	
	ATT6	0.820	
Subjective norm	SN1	0.728	
	SN2	0.806	
	SN3	0.815	
	SN4	0.823	
	SN5	0.800	
	SN6	0.728	
Perceived behavioural control	PBC1	0.758	
	PBC2	0.813	
	PBC3	0.817	
	PBC4	0.835	
	PBC5	0.793	
	PBC6	0.832	
Financial literacy	FL1	0.698	FL1 is removed.
	FL2	0.774	
	FL3	0.759	
	FL4	0.814	
	FL5	0.791	
	FL6	0.739	
Perceived risk	PR1	0.840	
	PR2	0.878	
	PR3	0.864	
	PR4	0.741	
	PR5	0.910	
	PR6	0.858	
Intention to make optimal decision for purchasing life insurance	INT1	0.769	
	INT2	0.845	
	INT3	0.825	
	INT4	0.825	
	INT5	0.794	
	INT6	0.829	
Hyperbolic discounting	HD1	0.743	
	HD2	0.835	
	HD3	0.728	
	HD4	0.820	
	HD5	0.846	
	HD6	0.785	
Optimal decision of life insurance purchase behaviour	OD1	0.829	
	OD2	0.866	
	OD3	0.835	
	OD4	0.856	

	OD5	0.874	
	OD6	0.831	

(a) Before removing ATT1 and FL1

PLS OUTPUT



Internal Consistency Reliability and Convergent Validity

	Cronbach's alpha	rho a	Composite reliability	AVE
ATT	0.871	0.877	0.903	0.611
SN	0.875	0.880	0.905	0.616
PBC	0.894	0.894	0.919	0.654
FL	0.856	0.858	0.893	0.583
PR	0.922	0.928	0.940	0.722
HD	0.882	0.894	0.911	0.631
INT	0.899	0.899	0.922	0.664
OD	0.922	0.923	0.939	0.720