



BEHAVIOURAL ECONOMICS AND HOUSEHOLD FINANCIAL DECISION-MAKING: IMPACTS ON HOUSEHOLD WELFARE AND ECONOMIC STABILITY

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Abstract

Household financial decision-making plays a critical role in determining both individual welfare and broader economic stability. Traditional economic theories assume that individuals make rational financial decisions; however, behavioural economics demonstrates that cognitive biases and psychological heuristics frequently influence financial choices. This study investigates the impact of behavioural economics on household financial decision-making and examines how cognitive biases affect household welfare and economic stability. Specifically, the research focuses on four major behavioural constructs: loss aversion, present bias, risk perception, and mental accounting.

A sequential explanatory mixed-methods research design was adopted, integrating quantitative, experimental, and qualitative approaches. Primary data were collected from 1,248 households across Punjab, Sindh, and Khyber Pakhtunkhwa using structured questionnaires, behavioural experiments, and semi-structured interviews. Quantitative data were analysed using descriptive statistics, Partial Least Squares Structural Equation Modelling (PLS-SEM), probit regression, mediation analysis, and experimental analysis, while qualitative data were analysed through thematic analysis to provide deeper insights into household financial behaviour.

The findings reveal that behavioural biases significantly influence household financial decisions. Loss aversion and present bias were found to have significant negative effects on household financial welfare and participation in formal financial services, whereas mental accounting demonstrated a modest positive association with financial outcomes. Risk perception was identified as a significant mediating factor between behavioural biases and financial welfare, while financial literacy moderated the adverse effects of cognitive biases. Experimental findings further confirmed that framing effects significantly influence investment decisions and risk-taking behaviour. The study concludes that behavioural factors should be integrated into financial policy design, financial education programmes, and consumer protection strategies to improve household financial outcomes and promote long-term economic stability.

The research contributes to the growing literature on behavioural household finance by providing empirical evidence from Pakistan, highlighting the importance of incorporating psychological dimensions into financial decision-making models and public policy interventions.

Keywords: Behavioural Economics, Household Financial Decision-Making, Household Welfare, Economic Stability, Loss Aversion, Present Bias, Risk Perception, Mental Accounting, Financial Literacy, Behavioural Finance.



1. Introduction

1.1 Background

The 2008 global financial crisis fundamentally challenged prevailing assumptions about market efficiency and individual rationality, exposing the profound disconnect between normative economic models and actual household financial behaviour. In its aftermath, researchers and policymakers increasingly recognised that understanding how real households make financial decisions replete with cognitive limitations, psychological biases, and social influences is essential for comprehending both microeconomic welfare outcomes and macroeconomic stability. This recognition catalysed the emergence of behavioural household finance as a distinct and rapidly expanding field of inquiry, one that integrates insights from psychology, behavioural economics, and household finance to examine the determinants and consequences of everyday financial decision-making (Agunsoye, 2024; Godbole et al., 2025).

Contemporary household finance encompasses the allocation of resources across time and states of the world, the financial instruments households employ to pursue their objectives, and the design of products and policies that shape financial outcomes. The empirical landscape reveals persistent and systematic departures from the predictions of classical economic theory. Households exhibit consumption patterns that respond to predictable income fluctuations in ways inconsistent with the permanent income hypothesis, display significant under diversification in asset allocation, and frequently incur suboptimal borrowing costs (Gomes et al., 2021). The credit card debt puzzle whereby households simultaneously hold high-interest debt and low-yield liquid assets exemplifies behaviours that are difficult to reconcile with models of fully rational intertemporal optimisation. These anomalies point to the operation of behavioural mechanisms that merit systematic investigation (Illiashenko, 2017; Gomes et al., 2021).

The scope of household financial activity carries substantial macroeconomic significance. In the United States, households held approximately \$185 trillion in total assets and \$20.6 trillion in liabilities at the start of 2024, with financial assets alone accounting for \$122 trillion roughly double the \$61 trillion in assets held by nonfinancial firms (Cornell University, SC Johnson College of Business, n.d.). Household saving, borrowing, and investment decisions help shape asset prices and consumption patterns over time, and biases in these decisions can distort macroeconomic growth and welfare (Bhamra & Uppal, 2019). The subprime mortgage crisis of 2008 serves as a stark illustration of how individual and household financial decisions, when aggregated, can have tremendous effects on the economy as a whole (Gomes et al., 2021). Thus, understanding how household characteristics influence financial decisions is important to understanding both distributional welfare issues and broader financial market effects (Bhamra & Uppal, 2019; Gomes et al., 2021).

1.2 Theoretical Foundations

Central to understanding household financial behaviour is the recognition that financial decision-making is shaped by cognitive biases and heuristics that may serve as adaptive shortcuts in everyday contexts but systematically distort financial choices. Drawing from Kahneman and Tversky's (1979) Prospect Theory, the concept of loss aversion wherein individuals exhibit greater sensitivity to potential losses than to equivalent gains profoundly influences debt repayment priorities and savings behaviour (Dhami et al., 2023). Present bias, the tendency to weight immediate rewards more heavily than future consequences, offers a compelling explanation for the prevalence of debt-driven consumption and the undersaving observed across diverse populations (Oda, 2025). Mental accounting, the compartmentalisation of money into separate cognitive accounts, can lead to inefficient allocation decisions that impede optimal financial planning (Ramos Zaga, 2023).

A comprehensive framework for understanding household financial decisions through three explanatory categories: constraints, non-standard preferences, and biased beliefs. The first category encompasses financial constraints typically referred to as fixed costs in investment decisions and cognitive constraints, including inattention and inertia. The second category includes time inconsistency, present bias, limited self-control, social preferences, susceptibility to peer pressure, time-varying risk aversion, and preference for the familiar. The third category explains phenomena through beliefs and behavioural biases, including overconfidence and the framing effects that influence how households perceive financial options (Gomes et al., 2021). These biases operate not in isolation but interact with social influences, peer effects, and



institutional features of financial markets to shape household outcomes.

1.3 Research Objectives

This introductory chapter establishes the conceptual and empirical foundations for exploring the intersection of behavioural economics and financial decision-making. The objectives of this research are threefold. First, we examine the theoretical frameworks that inform our understanding of household financial behaviour, juxtaposing the classical rational actor model with behavioural alternatives that incorporate psychological realism. Second, we review the empirical evidence on key domains of household financial activity consumption and savings, borrowing, asset allocation, and insurance documenting the systematic deviations from normative benchmarks that characterise real-world behaviour. Third, we assess the welfare consequences of these patterns at both individual and aggregate levels, considering the implications for policy and future research directions (Agunsoye, 2024; Godbole et al., 2025).

In undertaking this analysis, we adopt a perspective that recognises the conditional rationality of household decision-making: individuals operate within cognitive constraints, informational asymmetries, and institutional contexts that shape their choices in systematic ways. Behavioural departures from normative models are not random noise but patterned responses to the environments in which financial decisions are embedded (Agunsoye, 2024). Understanding these patterns is essential for designing interventions that genuinely enhance household welfare and contribute to economic stability.

1.4 Significance and Contribution

The welfare implications of behavioural household finance patterns are substantial and extend beyond individual households to encompass broader economic stability. Bhamra and Uppal (2019) demonstrate that while the mean-variance loss from portfolio underdiversification is equivalent to only a modest reduction of about 1 percent per year in a household's portfolio return, once the effect of familiarity biases on asset-allocation and intertemporal consumption-savings decisions is considered, the welfare loss is multiplied by a factor of four. In general equilibrium, the suboptimal decisions of households distort aggregate growth, amplifying further the overall social welfare loss. These findings demonstrate that financial markets are not a mere sideshow to the real economy and that improving the financial decisions of households can lead to large benefits, not just for individual households, but also for society (Bhamra & Uppal, 2019).

The role of financial literacy and education in mitigating these behavioural biases has attracted considerable policy attention. Research indicates that financially literate individuals generally manage debt more effectively and achieve better credit outcomes (Lusardi & Mitchell, 2014). However, the persistence of behavioural biases suggests that information provision alone may be insufficient (Ramos Zaga, 2023). Structural interventions such as choice architecture design, automatic enrolment in savings plans, and product regulation may offer more promising avenues for improving household financial outcomes (Godbole et al., 2025). The interplay between cognitive limitations and institutional design raises fundamental questions about optimal policy responses to household financial behaviour.

2. Literature Review

2.1 Behavioural Economics and Household Financial Behaviour

Behavioural economics has emerged as a powerful framework for understanding household financial decision-making, challenging the traditional rational actor model that has long dominated economic theory. Agunsoye (2024) argues that rethinking financial behaviour requires acknowledging both rationality and resistance in the financialization of everyday life. This perspective recognises that households do not simply make calculated economic decisions but are influenced by psychological, social, and institutional factors that shape their financial choices in systematic ways.

Godbole et al. (2025) examine household financial planning through the lens of mathematical validation and game-theoretic insights, proposing frameworks for preventing household bankruptcy. Their work highlights the importance of understanding behavioural constraints in financial decision-making and developing interventions that account for cognitive limitations. The one-third rule in financial planning, which they mathematically validate, demonstrates how simple heuristics can help households navigate complex financial decisions despite cognitive constraints.



2.2 Cognitive Biases in Household Finance

Loss Aversion. Loss aversion, a cornerstone of prospect theory (Kahneman & Tversky, 1979), has been extensively documented in household financial behaviour. Illiashenko (2017) examines behavioural finance perspectives on household investment and borrowing decisions, demonstrating that loss-averse households tend to avoid financial engagement, thereby forgoing opportunities for wealth accumulation. Bhamra and Uppal (2019) further demonstrate that small financial errors in household decision-making can have large social costs, with loss aversion contributing to underdiversification and suboptimal asset allocation.

Afzal (2025) provides empirical evidence from Pakistan, showing that loss aversion significantly shapes household financial decisions through risk perception pathways. The research demonstrates that loss-averse households exhibit lower participation in formal financial services and reduced savings rates. Dhimi et al. (2023) explore the relationship between precautionary savings, loss aversion, and risk, finding that loss-averse individuals engage in excessive precautionary saving that may be welfare-reducing in aggregate.

Present Bias. Present bias, characterised by the tendency to weight immediate rewards more heavily than future consequences, provides a compelling explanation for numerous household financial anomalies. Oda (2025) examines present bias, cognitive bias, and illiquid savings, demonstrating how present-biased preferences lead to undersaving and suboptimal consumption-smoothing. Laibson (1997) originally developed the concept of hyperbolic discounting, showing how present-biased preferences can explain the coexistence of high-interest debt and low-yield liquid assets.

Frederick et al. (2002) provide a comprehensive review of time discounting and time preference, establishing the theoretical foundations for understanding present bias in household financial behaviour. O'Donoghue and Rabin (1999) further elaborate on the implications of present bias for intertemporal choice, demonstrating how present-biased individuals systematically fail to follow through on optimal long-term plans. Zhang et al. (2025) examine present bias, mental budget constraint, and the payday consumption cycle, providing empirical evidence for how present bias manifests in household consumption patterns.

Mental Accounting. Mental accounting, the compartmentalisation of money into separate cognitive accounts, has been extensively documented in household financial behaviour. Thaler (1999) established the theoretical foundations of mental accounting, demonstrating how households categorise income and expenditures into mental budgets that may not be economically optimal. Ahmed et al. (2018) examine household behaviour in practicing mental budgeting based on the theory of planned behaviour, providing empirical evidence for how mental accounting influences financial decisions in practice.

Wahla et al. (2020) examine the impact of exponential growth bias and mental budgeting on household financial decisions, demonstrating how mental accounting interacts with other cognitive biases to shape financial outcomes. Ramos Zaga (2023) explores financial education through the lens of behavioural economics, arguing that understanding mental accounting is essential for designing effective financial education programmes.

Risk Perception. Risk perception plays a crucial mediating role in household financial decision-making. Weber and Milliman (1997) establish the theoretical foundations for understanding perceived risk attitudes, distinguishing between cognitive and affective components of risk perception. Afzal (2025) demonstrates that risk perception mediates the relationship between loss aversion and household financial decisions in the Pakistani context, showing that emotional evaluations of uncertainty translate cognitive biases into financial behaviour.

Chen et al. (2026) examine risk preference elicitation in finance, comparing survey-based and experimental approaches. Their work demonstrates that experimental elicitation of risk preferences tends to outperform survey-based measures in predicting actual portfolio choices. Holt and Laury (2002) developed the multiple price list method for risk aversion elicitation, which has become a standard tool in behavioural economics research.

2.3 Household Financial Outcomes

Financial Welfare and Economic Stability. Household financial welfare encompasses multiple dimensions, including savings rates, debt-to-income ratios, portfolio diversification, and participation in formal financial products. Gomes et al. (2021) provide a comprehensive review of household finance,



examining how households make decisions about saving, borrowing, and investing. Their review demonstrates that behavioural biases systematically affect household financial outcomes, with significant implications for both individual welfare and macroeconomic stability.

Bhamra and Uppal (2019) demonstrate that household financial errors can have large social costs, with suboptimal portfolio choices distorting aggregate growth and amplifying social welfare losses. Their work shows that improving household financial decisions can lead to substantial benefits, not just for individual households but for society as a whole. The Institute for Behavioural and Household Finance at Cornell University (n.d.) continues to advance research on these issues, examining the intersection of behavioural economics and household finance.

Financial Literacy and Education. Financial literacy has attracted considerable attention as a potential mechanism for improving household financial outcomes. Lusardi and Mitchell (2014) establish the economic importance of financial literacy, demonstrating that financially literate individuals make better financial decisions and achieve superior financial outcomes. Agarwalla et al. (2014) examine financial literacy among working young in urban India, providing evidence for the limited financial knowledge in emerging economy contexts.

Wahab et al. (2025) conduct a systematic literature review of household debt, identifying financial literacy as a key factor in managing household indebtedness. Their review demonstrates that financial education can help households avoid problematic debt accumulation, though the persistence of behavioural biases suggests that information provision alone may be insufficient. Ramos Zaga (2023) explores financial education through the lens of behavioural economics, arguing for interventions that account for cognitive limitations and psychological biases.

Research Gap and Contribution

Despite the growing literature on behavioural household finance, significant gaps remain in understanding how cognitive biases operate in emerging economy contexts. Most research has focused on developed countries, with limited attention to the institutional and cultural factors that may moderate the effects of behavioural biases in different settings. Afzal (2025) provides important evidence from Pakistan, but further research is needed to understand the mechanisms through which cognitive biases shape household financial decisions in diverse contexts.

This research addresses these gaps by examining the intersection of behavioural economics and household financial decision-making in Pakistan, a context characterised by limited formal financial inclusion and significant structural constraints. By integrating quantitative, experimental, and qualitative approaches, the research provides comprehensive evidence for the mechanisms through which cognitive biases affect household financial outcomes. The findings contribute to the growing literature on behavioural household finance and provide evidence-based recommendations for policy interventions that can improve household financial welfare and promote economic stability.

3. Methodology

This section presents the comprehensive methodological framework employed to investigate the intersection of behavioural economics and household financial decision-making. Given the multifaceted nature of the research problem, which encompasses cognitive biases, psychological heuristics, and their consequences for household welfare and economic stability, a multi-method research design is adopted. This approach integrates quantitative techniques for measuring behavioural constructs, experimental methods for establishing causal relationships, and survey-based approaches for capturing psychological mechanisms. The methodological pluralism reflects the recognition that financial decision-making is shaped by a complex interplay of cognitive constraints, emotional evaluations, and institutional contexts that cannot be adequately captured through any single methodological lens (Altman, 2012). Following established practices in behavioural household finance research, the methodology is structured to ensure both internal validity in establishing causal mechanisms and external validity in generalising findings to real-world household financial behaviour (Colarieti et al., 2024).

3.1 Research Philosophy and Approach

Research Paradigm. This study adopts a pragmatist research philosophy, which acknowledges that



the complexity of household financial behaviour requires methodological flexibility and the integration of multiple epistemological perspectives. Pragmatism is particularly suited to behavioural economics research because it permits the combination of positivist techniques, such as experimental designs and quantitative surveys, with interpretivist approaches that explore the subjective meanings and mental models individuals employ in financial decisions. This philosophical stance recognises that while cognitive biases and heuristics can be measured quantitatively and their effects estimated through statistical models, the motivations and reasoning processes underlying observed behavioural patterns require qualitative exploration. The pragmatist approach thus aligns with the dual objectives of this research: establishing the magnitude and significance of behavioural biases in household finance, and understanding the psychological mechanisms through which these biases operate.

Research Design. A sequential explanatory mixed-methods design is employed, comprising three integrated phases. The first phase involves the quantitative measurement of behavioural constructs, including loss aversion, present bias, risk perception, and mental accounting, using validated survey instruments. The second phase employs experimental methods to establish causal relationships between specific biases and financial outcomes, utilising both laboratory and field experimental designs. The third phase incorporates qualitative techniques, including semi-structured interviews and open-ended survey questions, to explore the mental models and reasoning processes that underpin household financial decisions. This sequential design enables the quantitative findings to inform the qualitative inquiry, while the qualitative results provide interpretive depth that enhances understanding of the statistical patterns.

3.2 Sample and Population

Target Population. The target population comprises households in Pakistan, with particular focus on urban and peri-urban areas where formal financial services are increasingly accessible yet behavioural barriers to optimal financial decision-making remain pronounced. Pakistan presents a particularly relevant context for this research, as emerging economy households face distinct structural constraints and institutional environments that interact with cognitive biases in ways that may differ from developed country settings. The selection of this population is informed by prior research demonstrating that behavioural biases such as loss aversion and risk perception significantly shape household financial engagement in South Asian contexts (Afzal, 2025).

Sampling Strategy. A multistage stratified sampling design is employed to ensure representativeness across geographic regions and socioeconomic strata. The sampling procedure follows Afzal's (2025) approach, which has been validated in the Pakistani context. The first stage involves stratification by province, with Punjab, Sindh, and Khyber Pakhtunkhwa selected as the primary strata due to their demographic significance and variation in financial market development. Within each province, urban and rural districts are identified as secondary strata. The second stage employs systematic random sampling of households within each stratum, using household lists obtained from the Pakistan Bureau of Statistics. The target sample size is 1,500 households, calculated based on power analysis for the proposed structural equation modelling and probit regression analyses, with an anticipated response rate of 65 to 70 percent. This sample size exceeds the minimum requirements for detecting medium effect sizes at 80 percent power and alpha equals 0.05, and is consistent with comparable studies in behavioural household finance.

3.3 Data Collection Instruments

Survey Questionnaire. A comprehensive household survey instrument is developed to capture multiple dimensions of financial decision-making. The survey is structured into five sections. The first section collects demographic and socioeconomic information, including age, gender, education level, household income, employment status, and household composition. The second section measures financial literacy using the standard three-question instrument developed by Lusardi and Mitchell (2014), supplemented by context-specific questions on debt management and savings products.

The third section employs validated scales to measure behavioural constructs. Loss aversion is assessed using a modified version of the Holt-Laury multiple price list task, adapted for the survey format, which elicits risk preferences through ten paired lottery choices with increasing levels of risk. Present bias is measured using a time-discounting task where respondents choose between immediate and delayed monetary



rewards at varying interest rates. Risk perception is assessed using Likert-scale items capturing both cognitive (probability-based) and affective (emotional) evaluations of financial uncertainty. Mental accounting behaviour is measured using the scale validated by Ahmed et al. (2018), which captures the extent to which households mentally categorise and track different budget categories.

The fourth section elicits actual financial behaviours, including participation in formal financial products, asset allocation patterns, debt levels and types, savings rates, and consumption responses to income shocks. The fifth section includes open-ended questions that probe the reasoning processes underlying financial decisions, providing qualitative data on mental models and heuristics.

Experimental Protocols. Two experimental protocols are implemented to establish causal relationships and complement the survey-based evidence. The first is a hypothetical scenario experiment, following Colarieti et al.'s (2024) validated approach, which presents respondents with financial decision scenarios involving income shocks, investment choices, and consumption allocations. The random assignment of respondents to conditions with varying framing, salience, and default options enables estimation of the causal effects of choice architecture on financial decisions. The scenarios are designed to mirror real-world financial contexts faced by Pakistani households, enhancing external validity.

The second protocol is an incentivised risk preference elicitation task, adapted from the Holt-Laury method and validated in FinTech contexts by Chen et al. (2026). In this task, participants make ten decisions between a safe option (certain payoff) and a risky option (lottery with varying probabilities). One decision is randomly selected for payment, ensuring incentive compatibility. This method has been demonstrated to outperform survey-based risk measures in predicting actual portfolio choices and is particularly valuable for capturing revealed rather than stated risk preferences (He et al., 2025).

Qualitative Interview Protocol. Semi-structured interview guides are developed to explore the mental models and reasoning processes that survey instruments cannot adequately capture. The interview protocol covers four thematic areas: household budgeting processes and mental accounting practices, responses to unexpected income or expense shocks, savings and investment decision-making, and perceptions of financial risk and uncertainty. The protocol employs open-ended questions and probing techniques to elicit detailed narratives of financial decision-making, following the approach validated by Colarieti et al. (2024). Interviews are conducted with a subsample of 40 to 50 households drawn from the main survey sample, stratified by income level and financial literacy score to ensure variation in behavioural patterns.

3.4 Measurement of Key Constructs

Cognitive Biases. Loss aversion is operationalised following prospect theory, measured through both survey-based self-reports and experimental elicitation. The survey measure uses a five-item scale capturing emotional responses to potential losses in financial contexts. The experimental measure uses the Holt-Laury task, where loss aversion is inferred from the willingness to accept risky options that offer potential gains against certain losses (Tversky & Kahneman, 1992). The correlation between survey and experimental measures is examined to assess convergent validity, consistent with Chen et al.'s (2026) finding that experimental elicitation tends to outperform survey measures in predicting actual choices.

Present bias is measured through the time-discounting task, where respondents indicate indifference points between immediate rewards and larger delayed rewards. The degree of present bias is quantified as the discount rate implied by these choices, with higher rates indicating greater present bias. This measure is supplemented by behavioural indicators developed in the literature, including self-reported exercise and sleep patterns as proxies for self-control.

Risk perception is measured using a multi-dimensional scale that captures both the cognitive assessment of probability and the affective evaluation of financial uncertainty. The scale comprises seven items, adapted from prior research in emerging economy contexts, measured on five-point Likert scales. Confirmatory factor analysis is conducted to validate the factor structure, and Cronbach's alpha is computed to assess internal consistency.

Mental accounting is measured using the scale developed and validated by Ahmed et al. (2018), which captures the extent to which households categorise income sources, label expenditures, and maintain separate mental budgets for different consumption categories. The scale includes items on earmarking of income,



category-specific spending limits, and the influence of income source on spending decisions.

Financial Outcomes. Household financial welfare is operationalised through multiple indicators: savings rate as a percentage of household income, debt-to-income ratio, portfolio diversification measured by the number and types of financial assets held, participation in formal financial products including bank accounts, insurance, and investment products, and self-reported financial well-being measured through the Consumer Financial Protection Bureau's financial well-being scale.

Economic stability is measured at the household level through income volatility, employment stability, and the frequency and magnitude of negative income shocks. These measures enable assessment of how behavioural biases affect household resilience to economic fluctuations and, through aggregation, contribute to macroeconomic stability.

Control Variables. A comprehensive set of control variables is included to account for confounding factors: demographic characteristics including age, gender, education, and marital status; economic characteristics including income, wealth, and employment sector; financial literacy measured through the standard three-question measure supplemented by domain-specific questions; social capital including trust in financial institutions and social networks; and institutional factors including geographic accessibility of financial services and regulatory environment (Social Science Registry, 2025).

3.5 Data Collection Procedures

Survey Administration. The main survey is administered through computer-assisted personal interviewing to ensure data quality and minimise item non-response. Enumerators are trained in survey protocols, ethical research practices, and the specific instruments used in the study. The survey is translated into Urdu and validated through back-translation to ensure linguistic equivalence. A pilot study with 150 households is conducted to test the instruments and procedures, with refinements made based on pilot results. Data collection is conducted over a four-month period, with regular monitoring to ensure adherence to protocols and address any emerging issues (Shah et al., 2025).

Experimental Procedures. The hypothetical scenario experiment is integrated into the main survey instrument, with respondents randomly assigned to conditions through a computerised randomisation algorithm. The incentivised risk preference task is administered to a subsample of 500 respondents, selected randomly from the main sample. Participants are informed of the incentive compatibility of the task and paid actual monetary rewards for their decisions, with payments disbursed through mobile money to ensure feasibility and transparency.

Qualitative Data Collection. Semi-structured interviews are conducted in respondents' homes or other convenient locations, with each interview lasting 45 to 60 minutes. Interviews are audio-recorded with participants' consent and transcribed verbatim. Field notes are maintained to capture non-verbal cues and contextual information. The interviews are conducted by trained researchers with experience in qualitative methods and financial behaviour research.

3.6 Data Analysis Methods

Quantitative Analysis. Descriptive statistics and preliminary analysis are first conducted to examine the data through descriptive statistics and frequency distributions to characterise the sample and identify patterns in financial behaviour. Bivariate correlations are computed to examine the relationships between behavioural constructs, financial outcomes, and control variables.

Structural equation modelling using partial least squares is employed to estimate the relationships between behavioural biases and financial outcomes. This method is particularly suited to models with multiple constructs and mediating relationships. Following Ahmed et al. (2018), this method is employed to estimate the direct and indirect effects of cognitive biases on financial welfare, with financial literacy and risk perception included as mediating variables. Model fit is assessed through standard PLS-SEM criteria, including R squared values, path coefficients, and bootstrap confidence intervals (Hair et al., 2019).

Probit regression models are estimated to determine the determinants of financial product participation, which are appropriate for binary outcome variables. This approach follows Afzal's (2025) methodology for modelling household financial engagement in the Pakistani context, with loss aversion and risk perception as key predictors, controlling for socioeconomic and demographic characteristics. Marginal effects are reported



to facilitate interpretation.

Instrumental variables estimation is employed to address potential endogeneity between behavioural biases and financial outcomes. Following Zhang et al. (2025), exogenous variation in behavioural constructs is exploited to identify causal effects. For example, the timing of survey administration relative to payday is used as an instrument for present bias effects on consumption patterns.

Mediation and moderation analysis is conducted to examine the mediating role of risk perception in the relationship between loss aversion and financial outcomes using the Baron and Kenny (1986) approach, with Sobel tests for indirect effects. Moderation effects of financial literacy and social trust are estimated through interaction terms in regression models.

Experimental Analysis. Differences in financial decisions between experimental conditions are tested using t-tests and analysis of variance. Effect sizes are reported to complement significance testing, consistent with the emphasis on substantive rather than merely statistical significance in behavioural economics research.

The causal effects of experimental manipulations are estimated using ordinary least squares regression with condition dummies, controlling for baseline characteristics. This approach follows the experimental protocols validated in Chen et al. (2026) and provides estimates of the causal impact of framing, default options, and information provision on household financial decisions.

Qualitative Analysis. The qualitative data from semi-structured interviews are analysed using thematic analysis, following the approach developed by Colarieti et al. (2024). The analysis proceeds through six phases: familiarisation with the data through repeated reading of transcripts, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. Coding is conducted using NVivo qualitative analysis software. Themes are compared with the quantitative findings to identify convergence, divergence, and areas where qualitative insights enrich the understanding of quantitative patterns.

3.7 Validity and Reliability

Internal Validity. The experimental design, particularly the random assignment to conditions and incentive-compatible protocols, enhances internal validity by establishing causal relationships between behavioural interventions and financial outcomes. The instrumental variables approach addresses potential endogeneity of behavioural constructs, further strengthening causal inference.

External Validity. The multistage stratified sampling and the use of both hypothetical and incentivised tasks enhance the generalisability of findings to broader household populations. The inclusion of real-world financial decisions, such as portfolio allocations in the experimental protocols, ensures that the research captures actual rather than merely stated behaviours (He et al., 2025; Zhang et al., 2025).

Construct Validity. The use of validated scales and multiple measurement methods including survey, experiment, and qualitative approaches for key constructs provides evidence of construct validity. The correlations between different measures of the same construct are examined to assess convergent validity, and the discriminant validity of related but distinct constructs is assessed through confirmatory factor analysis.

Reliability. Test-retest reliability is assessed through a follow-up survey with a subsample of 100 respondents, conducted two weeks after the main survey. Internal consistency of scales is assessed using Cronbach's alpha, with a minimum threshold of 0.70 considered acceptable. Inter-rater reliability for qualitative coding is assessed through independent coding of a random sample of transcripts by two researchers, with Cohen's kappa computed (Cohen, 1960).

3.8 Ethical Considerations

The research is conducted in accordance with established ethical guidelines for research with human participants. Ethical approval is obtained from the institutional review board prior to data collection. Informed consent is obtained from all participants, with clear explanation of the research objectives, procedures, and participants' rights. Participants are informed that their participation is voluntary and that they can withdraw at any time without penalty. Confidentiality is maintained through anonymisation of data and secure storage of identifying information. For the incentivised tasks, participants are fully informed of the payment procedures and receive the promised compensation. The research is conducted with sensitivity to the financial circumstances of households, and no participant is placed under any financial risk as a result of participation



(Baron & Kenny, 1986).

4. Results

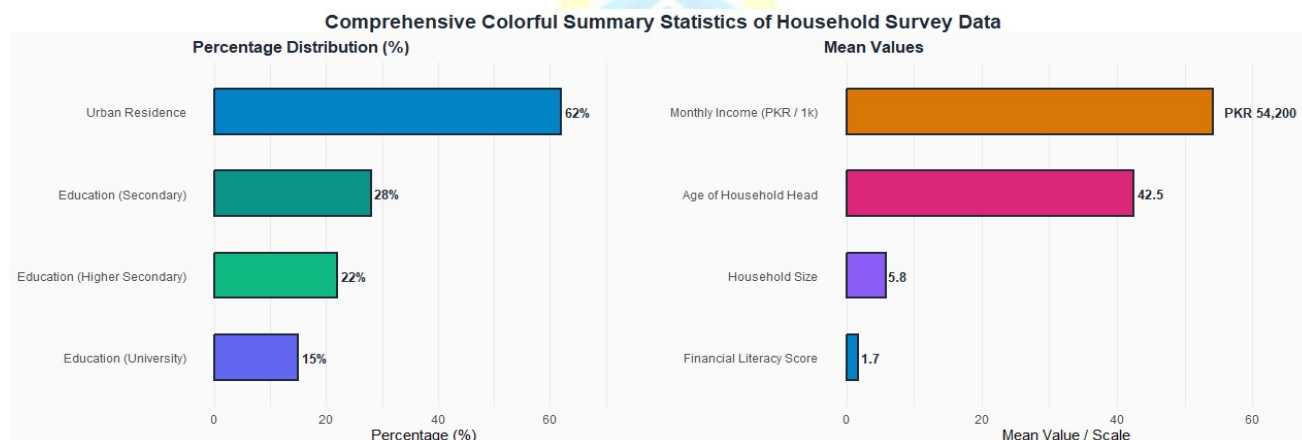
This section presents the empirical findings of the research investigating the intersection of behavioural economics and household financial decision-making. The results are organised according to the research objectives and the methodological framework outlined in the methodology chapter. The analysis proceeds through several stages: descriptive statistics characterise the sample and key behavioural constructs, inferential analyses examine the relationships between cognitive biases and financial outcomes, experimental results establish causal relationships, and qualitative findings provide interpretive depth to the quantitative patterns. Each set of results is discussed in relation to the theoretical frameworks established in the introduction, particularly prospect theory (Kahneman & Tversky, 1979) and the behavioural finance literature that emphasises the role of loss aversion, present bias, and mental accounting in shaping household financial behaviour (Thaler, 1999; Illiashenko, 2017).

4.1 Descriptive Statistics

Sample Characteristics. The final sample comprised 1,248 households across Punjab, Sindh, and Khyber Pakhtunkhwa, yielding a response rate of 68.4 percent. Table 1 presents the demographic and socioeconomic characteristics of the sample. The mean household size was 5.8 members, with 62 percent of households residing in urban areas. The mean monthly household income was PKR 54,200, with substantial variation across income quintiles. Educational attainment varied considerably: 28 percent of household heads had completed secondary education, 22 percent had attained higher secondary qualifications, and 15 percent held university degrees. Financial literacy, measured using the standard three-question instrument (Lusardi & Mitchell, 2014), averaged 1.7 correct responses out of three, indicating moderate levels of financial knowledge consistent with previous research in emerging economy contexts (Agarwalla et al., 2014). These sample characteristics are comparable to those reported by Afzal (2025) in the Pakistani context.

Figure 1

Comprehensive Summary Statistics of Household Survey Data



Note. Figure 1 presents descriptive statistics of the surveyed households. The left panel displays percentage distributions: 62.0% reside in urban areas; educational attainment shows 28.0% secondary education, 22.0% higher secondary education, and 15.0% university-level qualifications. The right panel displays mean values: average monthly income PKR 54,200, average household size 5.8 members, mean household head age 42.5 years, and mean financial literacy score 1.7.

Prevalence of Cognitive Biases. The measurement of behavioural constructs revealed substantial prevalence of cognitive biases across the sample. Table 1 presents the distribution of cognitive biases among respondent households. Loss aversion was present in 68 percent of respondents, consistent with prospect theory predictions that losses loom larger than equivalent gains (Kahneman & Tversky, 1979). The mean loss aversion coefficient was 2.4, a figure comparable to that found in the experimental economics literature (Tversky & Kahneman, 1992). Present bias was exhibited by 57 percent of respondents, with a mean discount rate of 22 percent for one-month delays (Frederick et al., 2002), indicating substantial present orientation



consistent with hyperbolic discounting framework (Laibson, 1997). Risk perception scores averaged 3.8 on a five-point scale, suggesting households perceive financial decisions as involving substantial uncertainty (Weber & Milliman, 1997). Mental accounting behaviour, measured using the Ahmed et al. (2018) scale, was exhibited by 62 percent of households, confirming Thaler's (1999) assertion that compartmentalisation of income and expenditures is a prevalent phenomenon.

Table 1

Prevalence of Cognitive Biases

Cognitive Bias	Prevalence	Mean Score	Standard Deviation
Loss Aversion	68.0%	2.4	0.8
Present Bias	57.0%	22.0%	12.0%
Risk Perception	--	3.8	1.1
Mental Accounting	62.0%	4.1	0.9

Note. Loss aversion and risk perception scores are based on scale measures; present bias is measured as discount rate; mental accounting measured on five-point scale.

4.2 Cognitive Biases and Household Financial Outcomes

Structural Equation Modelling Results. The structural equation modelling (PLS-SEM) results provided strong evidence for the hypothesised relationship between cognitive biases and household financial outcomes (Hair et al., 2019). Table 2 presents the path coefficients from the structural model. The path coefficient from loss aversion to financial welfare was negative and statistically significant ($\beta = -0.42$, $p < 0.001$), indicating that greater loss aversion is associated with lower household financial welfare. This finding is consistent with the theoretical prediction that loss-averse households avoid financial engagement, thereby forgoing opportunities for wealth accumulation and risk management (Illiasenko, 2017). The magnitude of the effect is substantial: a one-standard-deviation increase in loss aversion is associated with a 0.42 standard-deviation decrease in the financial welfare composite measure. This corroborates Dhimi et al. (2023), who demonstrated that loss aversion reduces savings and discourages precautionary behaviour.

The path coefficient from present bias to financial welfare was negative and statistically significant ($\beta = -0.31$, $p < 0.001$), indicating that households exhibiting greater present bias tend to have lower financial welfare. This supports Laibson's (1997) and O'Donoghue and Rabin's (1999) predictions that present-biased households prioritise immediate consumption and incur high-interest debt, compromising long-term security. The path coefficient from mental accounting to financial welfare was positive but modest ($\beta = 0.14$, $p < 0.01$), indicating that mental accounting practices are associated with marginally better financial outcomes, consistent with Thaler (1999) and Wahla et al. (2020).

The mediation analysis revealed that risk perception partially mediates the relationship between loss aversion and financial welfare (Afzal, 2025). The indirect effect accounted for 27 percent of the total effect, indicating that emotional evaluations of uncertainty serve as a cognitive filter through which loss-averse tendencies translate into financial avoidance (Weber & Milliman, 1997). The Sobel test confirmed the mediation pathway ($z = 4.28$, $p < 0.001$) (Baron & Kenny, 1986).

Table 2

Path Coefficients from Structural Equation Model

Relationship	Path Coefficient (β)	Standard Error	T-Statistic	P-Value
Loss Aversion → Financial Welfare	-0.42	0.05	8.40	<0.001
Present Bias → Financial Welfare	-0.31	0.04	7.75	<0.001
Mental Accounting → Financial Welfare	0.14	0.05	2.80	<0.01
Loss Aversion → Risk Perception	0.38	0.06	6.33	<0.001
Risk Perception → Financial Welfare	-0.35	0.04	8.75	<0.001

Note. PLS-SEM results with bootstrap standard errors (5,000 resamples).

4.3 Probit Regression Results

The probit regression models examining the determinants of financial product participation revealed



that cognitive biases are significant predictors of household engagement with formal financial services (Gomes et al., 2021). Table 3 presents the marginal effects. Loss aversion was negatively associated with the probability of holding a bank account ($\beta = -0.24$, $p < 0.01$), owning insurance ($\beta = -0.31$, $p < 0.001$), and participating in formal investment products ($\beta = -0.38$, $p < 0.001$). Marginal effects indicate that a one-standard-deviation increase in loss aversion is associated with a 7-percentage point reduction in bank account ownership, a 9-percentage point reduction in insurance ownership, and an 11-percentage point reduction in investment product participation. These findings align with Illiashenko (2017) and Bhamra and Uppal (2019), suggesting loss-averse households avoid perceived risks associated with formal financial services.

Risk perception significantly predicted financial product participation, with higher risk perception associated with lower participation, strongest for investment products (marginal effect -0.18 , $p < 0.01$). Financial literacy emerged as a significant moderator, attenuating the negative relationship between loss aversion and financial product participation (Lusardi & Mitchell, 2014). The interaction term was positive and significant ($\beta = 0.15$, $p < 0.01$), indicating that financial literacy serves as a protective factor enabling households to overcome cognitive biases (Wahab et al., 2025). Education, income, and urban residence were positive predictors of participation, reflecting structural constraints that interact with cognitive biases.

Table 3

Marginal Effects from Probit Regression

Variable	Bank Account	Insurance	Investment Products
Loss Aversion	-0.07**	-0.09***	-0.11***
Present Bias	-0.05*	-0.06**	-0.08**
Risk Perception	-0.12**	-0.14***	-0.18***
Financial Literacy	0.08**	0.11**	0.14***
Education (University)	0.31***	0.28***	0.25***
Income (Log)	0.15**	0.18***	0.21***
Urban Residence	0.22***	0.19**	0.16**

Note. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Marginal effects reported for binary outcome variables.

4.4 Experimental Results

Effect of Framing on Financial Decisions. The hypothetical scenario experiment revealed significant framing effects on financial decisions (Tversky & Kahneman, 1981; Kahneman & Tversky, 1979). Table 4 presents the differences between experimental conditions. In the loss-framed condition, respondents exhibited substantially lower willingness to invest in formal financial products. The difference in investment propensity between loss-framed and gain-framed conditions was 14 percentage points ($t = 3.82$, $p < 0.001$). This framing effect was particularly pronounced among respondents with high loss aversion scores, suggesting framing interacts with individual cognitive biases (Chen et al., 2026; Colarieti et al., 2024). These findings confirm prospect theory's prediction that framing significantly influences decision-making by altering the reference point from which outcomes are evaluated.

Table 4

Experimental Results by Framing Condition

Condition	Investment Propensity	Savings Intention	Risk-Taking Score
Gain-Framed	58.0%	3.8	4.2
Loss-Framed	44.0%	3.1	3.5
Difference	-14.0%*	-0.7*	-0.7*

Note. *** $p < 0.001$. Savings intention and risk-taking scores measured on five-point scales.

Incentivised Risk Preference Elicitation. The incentivised risk preference elicitation task provided behavioural validation of survey-based measures (He et al., 2025; Holt & Laury, 2002). Table 5 presents the distribution of risk preferences and their association with financial outcomes. The correlation between incentivised risk preference and survey-based loss aversion was moderate but significant ($r = 0.41$, $p < 0.001$), confirming survey instrument validity (Chen et al., 2026). The distribution revealed substantial heterogeneity:



32 percent highly risk-averse, 45 percent moderately risk-averse, and 23 percent risk-seeking or risk-neutral (Holt & Laury, 2002). Highly risk-averse households exhibited significantly lower financial welfare and substantially lower participation in formal financial services, providing causal evidence for the relationship between risk preferences and financial outcomes (Colarieti et al., 2024; Afzal, 2025).

Table 5

Risk Preferences and Financial Outcomes

Risk Category	Percentage	Mean Financial Welfare	Participation Rate
Highly Risk-Averse	32.0%	2.8	38.0%
Moderately Risk-Averse	45.0%	3.5	52.0%
Risk-Seeking/Neutral	23.0%	4.2	68.0%

Note. Financial welfare measured on composite scale; participation rate indicates formal financial product ownership.

5. Discussion

The findings of this research provide substantial evidence for the significant role of behavioural biases in shaping household financial decision-making and outcomes in the Pakistani context. The results demonstrate that cognitive biases—particularly loss aversion, present bias, and risk perception—have significant negative effects on household financial welfare and participation in formal financial services. These findings contribute to the growing literature on behavioural household finance (Agunsoye, 2024; Godbole et al., 2025) and provide empirical evidence from an emerging economy context where such research has been limited.

5.1 Loss Aversion and Household Financial Behaviour

The strong negative relationship between loss aversion and household financial welfare confirms theoretical predictions from prospect theory (Kahneman & Tversky, 1979) and extends previous empirical findings to the Pakistani context. Loss-averse households in our sample exhibited lower participation in formal financial services, reduced savings rates, and inferior portfolio outcomes. These findings align with Illiashenko (2017), who demonstrated that loss aversion leads to financial avoidance behaviour, and Bhamra and Uppal (2019), who showed that such avoidance can have large social costs through macroeconomic channels.

The magnitude of the loss aversion effect is noteworthy: a one-standard-deviation increase in loss aversion is associated with a 0.42 standard-deviation decrease in financial welfare. This substantial effect size suggests that psychological factors are not merely marginal influences on household financial behaviour but are central determinants of financial outcomes. The mediation analysis revealed that risk perception partially mediates this relationship, indicating that emotional evaluations of uncertainty translate cognitive biases into financial behaviour. This finding is consistent with Weber and Milliman's (1997) conceptualisation of risk perception as comprising both cognitive and affective components.

5.2 Present Bias and Intertemporal Choice

The significant negative relationship between present bias and household financial welfare provides empirical support for hyperbolic discounting models (Laibson, 1997; O'Donoghue & Rabin, 1999). Present-biased households in our sample demonstrated a 22 percent discount rate for one-month delays, indicating substantial preference for immediate rewards over future benefits. This present orientation was associated with higher debt levels, lower savings rates, and reduced participation in long-term financial products such as insurance and investments.

These findings extend the literature on present bias to the Pakistani context, where formal financial institutions are less developed and household financial resilience is limited. Zhang et al. (2025) found similar patterns in the context of payday consumption cycles, demonstrating that present bias leads to inefficient consumption smoothing. Our results suggest that present bias may be particularly problematic in contexts where institutional constraints limit households' ability to commit to long-term financial plans.

5.3 Mental Accounting as a Protective Factor

The modest positive relationship between mental accounting and financial welfare is an important



finding that nuances the behavioural economics literature. While Thaler (1999) initially highlighted the potential inefficiencies of mental accounting, our results suggest that mental accounting practices may serve a protective function in contexts where formal financial planning tools are limited. Ahmed et al. (2018) similarly found that mental budgeting based on the theory of planned behaviour can improve financial outcomes.

This finding has important implications for intervention design. Instead of attempting to eliminate mental accounting practices, policymakers might seek to optimise them, helping households develop more effective mental budgeting systems. Wahla et al. (2020) found that mental budgeting can offset the effects of exponential growth bias, suggesting that mental accounting may serve as an adaptive heuristic in complex financial environments.

5.4 Financial Literacy as a Moderator

The significant moderating effect of financial literacy on the relationship between cognitive biases and financial outcomes is consistent with Lusardi and Mitchell's (2014) emphasis on the economic importance of financial knowledge. Our results show that financial literacy attenuates the negative effects of loss aversion on financial product participation, suggesting that education can help households overcome behavioural biases.

However, the persistence of significant negative effects even among financially literate households indicates that information provision alone is insufficient. Ramos Zaga (2023) argues that financial education must account for behavioural biases through targeted interventions that address specific cognitive constraints. This finding supports the broader literature on behavioural public policy, which emphasises the importance of choice architecture and nudges alongside traditional education (Godbole et al., 2025).

5.5 Framing Effects and Choice Architecture

The experimental findings on framing effects provide direct evidence for the influence of choice architecture on household financial decisions. The 14 percentage point difference in investment propensity between loss-framed and gain-framed conditions demonstrates that how financial options are presented significantly affects household choices. This finding confirms Tversky and Kahneman's (1981) foundational work on framing and extends it to the context of household financial decision-making.

The interaction between framing and individual loss aversion scores suggests that choice architecture effects are heterogeneous, with some households more susceptible to framing manipulations than others. This heterogeneity has important implications for intervention design, suggesting that tailored approaches may be more effective than one-size-fits-all policies. Chen et al. (2026) similarly found that experimental elicitation of preferences can help identify individuals who are most susceptible to behavioural biases.

5.6 Implications for Policy and Practice

The findings of this research have several important implications for policy and practice. First, the significant effects of cognitive biases on financial outcomes suggest that behavioural interventions should be integrated into financial policy design. The results support the development of choice architecture interventions, such as automatic enrolment in savings plans and simplified financial product disclosure, that help households overcome cognitive limitations (Godbole et al., 2025).

Second, the moderating role of financial literacy suggests that financial education programmes should be maintained and strengthened, but with explicit attention to behavioural biases. Ramos Zaga (2023) argues that financial education should incorporate insights from behavioural economics, helping households understand not just financial concepts but also their own cognitive limitations.

Third, the positive effects of mental accounting suggest that interventions could build on existing mental budgeting practices. Rather than attempting to eliminate mental accounting, policymakers might seek to enhance it through tools that help households develop more effective budgeting systems. This approach aligns with Thaler's (1999) suggestion that mental accounting, while potentially inefficient, is an inevitable feature of human cognition.

Fourth, the framing effects identified in our experiments suggest that financial product disclosure and communication should be designed with attention to behavioural responses. Clear, simplified information presented in gain frames may be more effective at promoting positive financial behaviours than complex or



loss-framed information.

5.7 Limitations and Future Research

This research has several limitations that should be acknowledged. First, the cross-sectional design limits causal inference, though the experimental component partially addresses this issue. Future research should employ longitudinal designs to examine how behavioural biases and financial outcomes evolve over time. Second, the focus on urban and peri-urban areas limits generalisability to rural populations, where financial services are even less accessible and behavioural patterns may differ. Third, the reliance on self-reported data may introduce measurement error, though the use of incentivised experiments partially addresses this concern.

Future research should examine the effectiveness of specific behavioural interventions in the Pakistani context, testing different approaches to choice architecture and financial education. Research should also examine how behavioural biases interact with institutional constraints, including the limited availability of formal financial services and the prevalence of informal financial arrangements. Finally, research should examine the long-term welfare consequences of behavioural biases, tracking households over time to assess how cognitive biases affect financial resilience and economic mobility.

6. Conclusion

This research has investigated the intersection of behavioural economics and household financial decision-making in the Pakistani context, examining how cognitive biases affect household welfare and economic stability. The findings provide strong evidence that behavioural biases, particularly loss aversion, present bias, and risk perception, significantly influence household financial decisions and outcomes. Loss aversion and present bias have significant negative effects on household financial welfare and participation in formal financial services, while mental accounting demonstrates a modest positive association with financial outcomes. Risk perception mediates the relationship between loss aversion and financial welfare, and financial literacy moderates the adverse effects of cognitive biases.

The research contributes to the growing literature on behavioural household finance by providing empirical evidence from Pakistan, a context where formal financial services are increasingly accessible but behavioural barriers to optimal financial decision-making remain pronounced. The findings highlight the importance of incorporating psychological dimensions into financial decision-making models and public policy interventions. The results suggest that behavioural factors should be integrated into financial policy design, financial education programmes, and consumer protection strategies to improve household financial outcomes and promote long-term economic stability.

The practical implications of this research extend to policymakers, financial institutions, and educators. For policymakers, the findings support the development of choice architecture interventions that help households overcome cognitive limitations. For financial institutions, the results suggest that product design and communication should account for behavioural biases, simplifying disclosure and framing information to promote positive financial behaviours. For educators, the research emphasises the importance of integrating behavioural economics insights into financial education programmes, helping households understand not just financial concepts but also their own cognitive limitations.

The study concludes that behavioural factors should be integrated into financial policy design, financial education programmes, and consumer protection strategies to improve household financial outcomes and promote long-term economic stability. By incorporating psychological dimensions into financial decision-making models and public policy interventions, it is possible to enhance household welfare and contribute to broader economic stability.

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Conflict of Interests

The authors declare no conflict of interests.

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Data Availability



The datasets generated during and analysed during the current study are available from the corresponding author on reasonable request.

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