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A Structural Equations Model of Qualitative Elements Influencing Automobile Insurance Uptake

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Abstract: *Around the world, automobile insurance (Comprehensive Coverage Policy) offers a greater coverage to vehicles and contributes significantly to insurance company's revenue as one of the popular policy choices of vehicle owners. However, the case is somewhat different in Bangladesh as such policy, on an average, adds comparatively less to the overall revenue of any typical insurance company. Besides financial terms, behavioral attributes and other qualitative aspects have wide-ranging influence on insurance decisions. This study explores potential antecedents of insurance uptake, including driving attributes, perception of accident risk, vehicle specifications, and neighborhood effects. The mediation effects of road safety awareness and insurance literacy on insurance uptake were also examined. Self-reported questionnaire was used to collect data through survey responses from 332 vehicle owners. The study findings suggest that road safety awareness and insurance literacy mediate some effects on automobile insurance uptake.*

Keywords: *Automobile insurance, comprehensive coverage policy, behavioral aspects, driving attributes, perception of accident risk, vehicle specifications, neighborhood effects, road safety awareness, insurance literacy*

Introduction

Though insurance industry in Bangladesh, as not being a mature one, is offering a promising growth, it is yet to offer its best to the economy. Experiences from insurance practices indicate that typical insurance companies concentrate business towards some particular policies in a wide range of insurance offers. Unlike other developing and developed countries, automobile insurance (Comprehensive Coverage Policy) has not been so popular in Bangladesh as other types of insurance products, i.e., life insurance, fire insurance, marine insurance etc. Among numerous reasons, substandard promotional activities, premium charges, insurance terms, claim settlement procedures and so on can be attributed to this present condition of automobile insurance. However, this particular insurance product could bring a lot to the insurance companies as well as to the vehicle

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owners, provided ample emphasis were offered to the qualitative variables that contribute most to the automobile decisions. Even though regulatory authorities and insurance firms are attempting a number of steps to recover the situation, the circumstance has not been quite improved. On the other hand, literatures with direct focus on such issues are relatively sporadic. Brockettet al. (2007) was found to study biological and psycho-behavioral issues for automobile insurance losses. Sherden (1984) studied price related determinants of automobile insurance and Park and Lemaire (2012) covered cultural impact on the demand for non-life insurance. Jelalian et al. (2000) scrutinized relationship between behavioral attributes and automobile crashes.

This study offered a direct focus towards the impact of qualitative elements on the automobile uptake decisions and insurance uptake was chosen as the dependent variable of the model. In accordance with the Motor Vehicle Amendment Act, 1991; having at least an "Act Liability Only Policy" or "3rd Party Liability Policy" insurance coverage is a must for any vehicle running in public places in Bangladesh. The premium for such insurance is also much lesser than the "Comprehensive Coverage Policy". For these reasons, about all of the registered vehicles in BRTA (Bangladesh Road Transport Authority) possess the "Act Liability Only Policy" and thus, in this study, the term "Automobile Insurance" denotes the "Comprehensive Coverage Policy" only. Therefore, the core focus of the study along with the control variables in questionnaire, survey results, data analysis, findings, and recommended actions targets to bring significant insights about the elements that influences the uptake of "Comprehensive Coverage Policy". This dependent variable was studied on the perspective of Bangladesh and data were collected from Bangladeshi car owners. Data related to the chosen qualitative elements was also availed in the context of vehicle owners of Bangladesh. The sample for this study contains 332 vehicle owners from diverse areas of Bangladesh with different demographic characteristics.

Insurance decision is a fairly complicated process that encounters a diverse set of variables. Apart from the quantitative variables, behavioral facts and other qualitative variables play a giant role in finalizing an insurance decision. The basic problem of this study was to examine the impact of selected qualitative variables over the insurance decisions of vehicle owners for their automobile. Hence, the dependent variable, accounted for automobile insurance uptake, covers the core concern of this study. The composite value for this dependent variable, i.e., insurance uptake was calculated considering various significant qualitative attributes that contribute in forming insurance decision of a vehicle owner. Thus, this dependent variable offers sufficient validation for addressing the problem adequately. On the other hand, this study attempted to discover the concurrent situation and relevant qualitative factors that have impact over automobile

insurance uptake in Bangladeshi vehicle owners. Thus, studying insurance uptake for automobile through data collection and analysis from the context of Bangladesh offers enough justifications for adequately addressing the problem.

Though a good number of studies can be found on the impact of qualitative factors over insurance decisions, literatures on the case of automobile insurance is not that much adequate. Even if there are studies examining the determinants of automobile insurance demand, most of those are concentrated over the quantitative factors of insurance. Among those quantitative papers, financial aspects of buyers and insurance related financial factors are highlighted much. However, the impact of behavioral facts, such as the buyers' perception of accident risk and driving attributes, on the uptake of automobile insurance are rarely addressed. Neighborhood effects and road safety awareness were also quite infrequent in studies for performing as influencing factors on automobile insurance decisions. Moreover, two other significant factors, i.e., insurance literacy and vehicle specifications were intermittent in studies that examined factors relating to automobile insurance uptake. This study attempts to fill the research gap in existing literature about scrutinizing the impact of qualitative factors, mostly the stated ones. In another case, if looked over the context, prevailing literatures lack a straight address over the case of Bangladeshi automobile insurance market and the impact of such specific qualitative elements on automobile decisions of Bangladeshi vehicle owners. Thus, from both the perspective of literature and context, the primary contribution of this study accounts for addressing the extent to which some specialized qualitative factors influence the automobile insurance uptake with special focus to the insurance market and vehicle owners in Bangladesh.

Rest of the paper contains an extensive literature review over the previous works on insurance uptake under different contexts, explaining the influencing qualitative factors and control variables etc. Theory section follows the literature review with a comprehensive idea about the conceptual model developed for this study and states the hypotheses. Method segment offers a vivid insight about methodology followed in sampling, measurement and analytical tools applied in this study. The following section discusses survey results and their analyses through different statistical measures. Findings of the study are presented in the discussion part with detailed implications for practical insurance business. Insights gained form this study and future scopes are presented in the same section while mentioning the limitations. The paper ends with a conclusion through summarizing the study findings, focusing on the primary contribution and insinuations about automobile insurance market in Bangladesh.

Literature review

Definition and Types of Automobile Insurance

Automobile insurance, may also be called as car insurance, vehicle insurance, motor insurance or auto insurance, explicitly denotes the insurance policy purchased for motor vehicles such as car, microbus, bus, truck and the like. The primary purpose of automobile insurance is to offer protection towards vehicle owners against different types of losses arising out of traffic and road accidents and other liabilities resulting from accidents. In Bangladesh, typically two forms of automobile insurance are found namely the Act Liability Only (3rd party) Policy and the Comprehensive Motor Insurance Policy. The first one covers the insured from third party liabilities and as per the Motor Vehicle Amendment Act, 1991; having at least an "Act Liability Only Policy" or "3rd Party Liability Policy" insurance coverage is a must for any vehicle running in public places. For complying with the motor vehicle act, all the vehicles registered in BRTA (Bangladesh Road Transport Authority)hold "Act Liability Only Policy". In addition to the compulsory 3rd party coverage, Comprehensive Motor Insurance offers protection the vehicle owner from diverse type of financial losses that may cause from accidental loss, damage and/or theft of vehicles. As these two insurance types differ significantly in their extent of coverage, premium rates are also different and naturally, "Comprehensive Coverage Policy" charges higher premium than the "Act Liability Only Policy". As "Act Liability Only Policy" is mandatory in Bangladesh, insurance companies as well as academic literatures should focus over the promotion and influencing factors over "Comprehensive Coverage Policy", which offers better protection of vehicles and thus the vehicle owners' well-being. Hence, the dependent variable of Automobile Insurance Uptake covers the full scope of "Comprehensive Coverage Policy".

Theories Relating to Qualitative Elements' Impact on Insurance Decisions

A number of factors can explain the vehicle owners' decision for insurance uptake. In an average, demand studies for insurance make use of the popular expected utility theory for explaining the insured's decisions for being under insurance cover for the vehicle owned. The essence of this theory states that insurance demand is actually a logical choice between a certain financial payment, i.e., premium and uncertain losses with probability while uninsured. In addition, this theory also summarizes that the more risk averse the individual is, the more will they be interested in buying insurance coverage. On the other hand, consumers' state e.g. socio-economic or health status, influence their tastes and utility level, as suggested by state-dependent utility theory. From variations in these sort of statuses, people will have varying degree of risk perceptions and thus, will show differences in their choices of insurance demand. Literatures focusing over the poverty-

line case of insured indicate a liquidity constrained situation for poorer section of society, which acts as an obstacle in the way of being insured even though they can live better lives with insurance. Based on the prospect theory, the updated consumer demand theory suggests that insured prefer uncertain losses to certain losses, given the expected magnitude is same for both cases. On another view over the education and insurance literacy, status quo bias and endowment effects suggest that individuals may find it complicated to decide over taking insurance specifically in situations where insurance literacy and education level are fairly low. If the poor individuals perceive the benefit of insurance as higher than costs of uncertain events, he/she will insure their valuables, provided that there is a good level of understanding of insurance policies and terms guided with proper education. However, the factors for trust building are of equal importance while explaining the insurance demand where trust can direct towards the insurer or a specific insurance product. Neighborhood effect can be quoted here for such trust building factors as the theory states that neighbor or peers with positive insurance history and attitude can influence an individual best for insurance uptake. Certain theories highlight the importance of institutional factors where level of technical arrangements by the insurance providers can influence people regarding the benefit of the insurance. Transparency in insurance policy rules, processes, requirements, and claim settlement procedure can create a greater level of trust among the parties willing to take up insurance. Theories of insurance providers state that non-enrollment and non-renewal of insurance contacts can be reasoned mostly from the insurance providers' inferior service quality. Supply side theories of financial institutions suggest that availability of good service as well as an easy channel to access them can attract more people under insurance coverage.

Behavioral Attributes and Magnitude of Risk

High-risk personalities are affiliated with driving recklessly and changing lanes from time to time as they have the urge for more tension, risk, and adventure in their lives. As a result, they fall prey to the traffic violation cases for speeding (Burns and Wilde, 1995). Persons having the tendency to score lower on control, harm avoidance, traditionalism and social closeness, and higher on aggression and alienation were more likely to be the victim of health risk behavior at the age of 21 (Caspi et al., 1997). Lifestyle tends to work as an important a factor for influencing high road traffic accident rates. Young drivers who consume alcohol at an unusual rate or drive without any specific purpose have high-accident risk. Persons who possess culture as the dominant trait in their lifestyle face lower accident risk. Religion also works as a factor in influencing the variation in rate of accident risk. Another perspective showed that young male drivers possess higher accident risk than young female drivers (Chilaoutakis, Darviri, and Demakakos, 1999). Traffic violations and risky driving behavior have positive correlation with alcohol, drug

use, and poor academic performance. Young male drivers show willingness to take risks than older drivers and as a result, young male drivers are overemphasized in traffic accidents. Older drivers have better perception on risk factors of driving than young drivers (Finn and Bragg, 1986). Risk taking tendency and demographic variables have higher correlation than the correlation between risk taking and driving accidents. Negative correlation exists between accidents and conviction (Furnham and Saipe, 1993). Young drivers possess some attributes higher than middle aged and older drivers and some of them are anger, hostility, confusion, bewilderment, depression, dejection, fatigue, inertia, tension, anxiety, lower vigor activity (Garrity and Demick, 2001). There is a highly positive association of lifestyle and accident risks in traffic (Gregersen and Berg, 1994). Probability of accidents increases as traffic convictions, low citizenship grades, high mileage increase (Harrington, 1972).

Incidents of high-accidents reported more socially deviant past activities, poorer school and parental relationships, more traffic convictions, higher driving mileage, more involvement with cars during high school and more emotionally involved driving. Risk perception and risk choice involves an attitude or sense of personal vulnerability and recognition of vulnerability may be the single most important mechanism underlying risk taking. Initially driving behavior was perceived as risky, but individuals showed acceptance towards the risk and once the behavior results in positive outcomes, the perception of risk was lowered (Jonah, 1986). Most studies showed positive correlation between sensation seeking and risky driving (Jonah, 1997). Determinants of behavioral change for risk taking are perceived as better determinants than perceived risks. However, both works as important factors (Parsons, Siegel, and Cousins, 1997). The value of time is associated with aggressive driving. Personality system accounted for double the amount of variance in risky driving as compared to perceived environment (Wilson and Jonah, 1988). Age, gender, and marital status are not associated with risk tolerance when financial knowledge and income are accounted for. Studies on insurance behavior presented an overview of psychological literature (Shanteau, 1992). The amount of insurance that the subjects are willing to buy changed little across conditions and beliefs about insurance, thus unaffected by events in the preceding year.

Qualitative Determinants' Impact on Insurance Decisions

Studies focused on finding qualitative determinants of insurance decisions found individual characteristics and household attributes as significant from the econometric modeling (Ito and Kono, 2010 and Morsink and Geurts, 2011). As per the expected utility theory, in case of insurance decisions, household level attributes and behavioral specifications should be focused more as the probability and magnitude of risk depends heavily over them (Ito and Kono, 2010). The buyers perception regarding the perceived

risk and corresponding benefits were also found significant to overcome adverse selection problem and influence insurance decisions (Carrin, 2003). In another study, household size and income correlated positively with the uptake of micro-insurance (Bendig and Arun, 2011). From the context of developing countries, the level of education performed as a significant determinant of insurance uptake. Insurance literacy, signifying the extent of understanding of insurance among the potential insurance buyers, has significant positive relation with insurance uptake (Sinha et al., 2006 and Ito and Kono, 2010). Households, managed by educated persons, were found to be more likely to be interested for being covered by insurance policies (Schneider and Diop, 2001 and Chankova et al., 2008). Contemporary quantitative researches have concentrated over buyers' insurance decisions and Morsink and Guerts (2011) found that neighborhood effect works as an informal trust-building factor. Knowing peers with claims was found as the most important factor to explain the variability in micro-insurance uptake (Morsink and Guerts, 2011). In contrast to Sinha, Patel and Gandhi (2006) and Ito and Kono (2010), Morsink and Guerts (2011) found no impact of insurance literacy over the insurance decisions by households. On another systematic review, the perception of risk, product understanding and societal factors, i.e., trust over financial institutions, had influenced insurance uptake (Ito and Kono, 2010). While conducting a systematic review over the micro-insurance uptake, (Morsink and Guerts, 2011) found financial literacy, trust, liquidity position, product design attributes and marketing efforts as having impacts over demand for micro-insurance.

Stimulus of Automobile Insurance Decisions

Even though literatures are quite inadequate in the segment of determining the elements that influence the automobile insurance uptake, there are certain analyses that attempted to address the problems from diverse views (Sherden, 1984 and Regan, 2001). Sherden (1984) executed an analysis regarding the determinants of automobile insurance demand, which shed light over the price elasticity of insurance products and buyers' reaction in association to that elasticity. It was found that the consumption of automobile insurance reacted marginally in case of a sharp rise in prices of insurance policies, in contrast to the cases of fluctuations in the price of other daily necessities and level of income (Sherden, 1984). The research added implications for product development and proper target marketing in relation to the consumers' response to income, price, and perceived risk magnitude. Sherden (1984) also called for effective regulation in pricing of automobile insurance and recommended that such pricing should be regulated strictly and/or the automobile insurance market should be more severe in competition. Blowset al. (2003) studied the relationship of car insurance and the risk of car crash injury with a sample of 588 randomly selected drivers from Auckland roads. Through a structural interview, the impacts of multiple confounders, including the risk relating behavior and socioeconomic

status, were assessed and eventually, injuries of car crash and insurance status were found to be associated (Blows et al., 2003). Johnson et at. (1993) conducted a series of studies where influences of biasness in perception of losses and assessments of probability towards the consumers' insurance decisions were tested. The study results exhibited distortions of individual customer's perception of risk while evaluating insurance premium and associated benefits (Johnson et at., 1993). However, Peck and Kuan (1983) developed a statistical model that uses driving record, biographical factors and the driving territory for predicting individual's risk of accident. With a random sample above 90,000 drivers, the study developed some prediction models through using the multiple regression technique. The study findings concluded that prior diving record showed a better prediction than territory, though both of them exhibit positive correlation with accidental risk (Peck and Kuan, 1983).

An interesting study finding were presented by Iversen et al. (2002) where the role of personality was judged in predicting the extent of accidental risk in drivers of Norway. The qualitative factors under personality traits were namely accident involvement, sensation seeking, risky driving, drivers' anger, locus of control and normlessness. Between the year 2000 and 2001, the study was carried out with a sample size of 2605 drivers and the results found that subjects having high sensation seeking, driving anger, and normlessness exhibited more magnitude in accidental risk (Iversen et al., 2002). Richaudeau (1999) tested the theory of adverse selection and moral hazard where the study tried to find whether the insured agents have higher accidental probability than that of the uninsured agents. With a probit model and generalized residuals based on the individuals from France, the study argued the theoretical relationship of accidental risk and automobile insurance contracts (Richaudeau, 1999). In the study of Brockett et al. (2007), they included some psycho-behavioral and biological correlates of credit scoring to test their association with automobile insurance losses. A good significance had been found regarding those qualitative variables and their impact over the extent of automobile insurance losses. The influence of cultural factors was assessed for the demand of nonlife insurance through regression techniques (Park and Lemairea, 2012). Panel data, collected from 68 countries with a 10-year tenure, were analyzed to check the cross-national factors that influence demand for nonlife insurance. The results summarized that the individuals from countries with low individualism, uncertainty avoidance, and power distance had taken more nonlife insurance coverage (Park and Lemairea, 2012).

Background of the Model

After analyzing the existing literature surrounding this study's problem, several independent variables were taken under considerations namely the driving attributes,

perception of accident risk, vehicle specifications, neighborhood effects, road safety awareness, and insurance literacy. These composite variables were all qualitative in nature and were believed to have a significant impact over the dependent variable of this study, i.e., automobile insurance uptake. The literature and theories related to automobile insurance offered a good support for the stated composite variables to include. Here, the driving attributes (DA) included the self-driving status, driving skill, knowledge about traffic rules and regulations, understanding and following of traffic indicators, signs, and writings by the vehicle owner. The vehicle owner's perception of accident risk (PAR) pertains his/her automobile related accidental experience, physical illness/loss due to accidents, physical illness/loss to family and friends due to accidents, experience of damaged vehicle in accidents, witnessing of automobile related accidents and severity of accidents to him/her. The type, pricing, condition, resale value, fitness level, and speed of the respondents' vehicle were referred to the variable named as vehicle specifications (VS). The road safety awareness (RSA) included the respondents' level of awareness in case of vehicle driving and road safety. This variable encompassed the periodic maintenance of vehicle, extent of dangerous driving, magnitude of crossing stop lines, degree of violating yellow lane markings and level of jumping traffic signals. The neighborhood effect (NGE) had also been an important variable in this study, which accounted for having familiar ones with automobile insurance policy, peers with positive claim settlement, associations who are happy with automobile insurance processes, near ones who educated the respondent about automobile insurance and referees for availing "Comprehensive Automobile Insurance Policy". Last but not the least, insurance literacy (IL) were measured through respondents' familiarity with insurance policies while covering different types of losses, knowledge about the formal processes, terms and services of automobile insurance and acquaintance regarding different types of insurance policies.

Among the independent variables stated above, road safety awareness (RSA) and insurance literacy (IL) acted as the mediating variables to test the mediating effects over the direct effects of driving attributes (DA), perception of accident risk (PAR), vehicle specifications (VS) and neighborhood effect (NGE) with the independent variable as insurance uptake (IU). Theory supports that the more a vehicle owner is aged and high income generating, the more will be the likelihood of him/her being under automobile insurance coverage. Thus, the study also included two moderating variables namely the age and income of respondents as to test the moderation effect of these two variables. The analysis had control variables, namely gender and education, to achieve a good model fit and demonstrate the results in an unbiased way while holding the respondents' gender and educational level as constants.

Below are the graphical representation of the conceptual model and the hypotheses of this study:

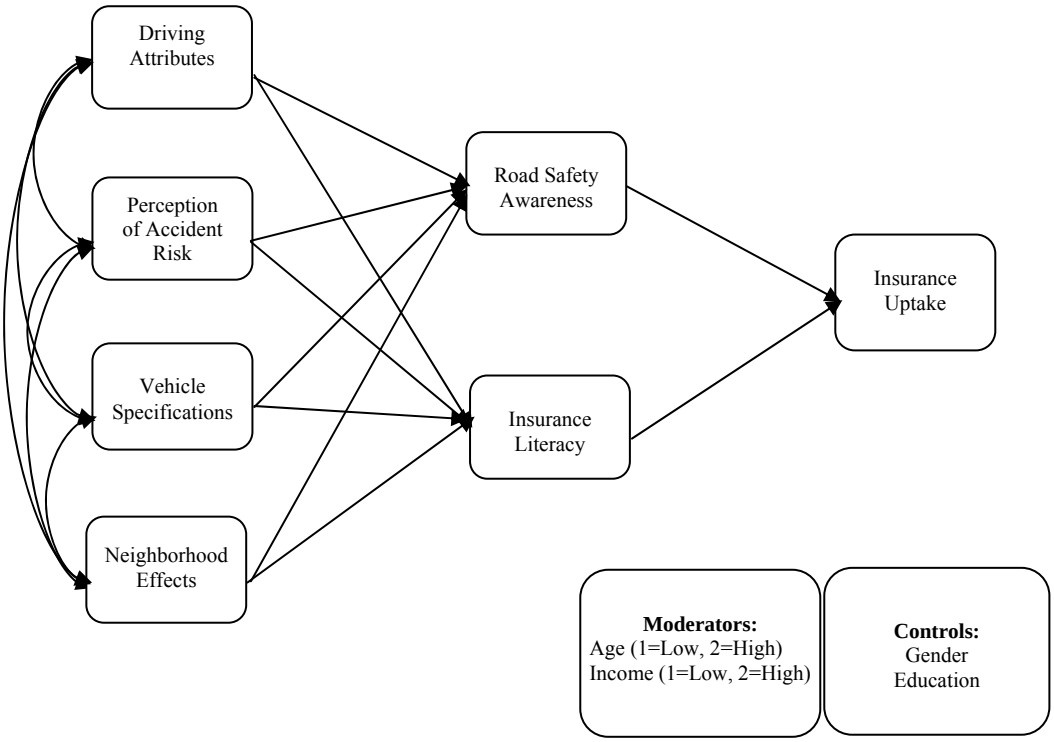

Figure 1: Conceptual Model for Automobile Insurance Uptake

Hypotheses

With controlling for Gender and Education, the following mediating and moderating hypotheses were formed on the basis of previously discussed theories and existing literature.

- *Mediation*

  H1a: Road Safety Awareness mediates the positive effect of Driving Attributes on Insurance Uptake.

  H1b: Road Safety Awareness mediates the positive effect of Perception of Accident Risk on Insurance Uptake.

  H1c: Road Safety Awareness mediates the positive effect of Vehicle Specifications on Insurance Uptake.

H1d: Road Safety Awareness mediates the positive effect of Neighborhood Effect on Insurance Uptake.

H2a: Insurance Literacy mediates the positive effect of Driving Attributes on Insurance Uptake.

H2b: Insurance Literacy mediates the positive effect of Perception of Accident Risk on Insurance Uptake.

H2c: Insurance Literacy mediates the positive effect of Vehicle Attributes on Insurance Uptake.

H2d: Insurance Literacy mediates the positive effect of Neighborhood Effect on Insurance Uptake.

- *Multi-group moderation*

H3a: Age moderates the positive effect of Road Safety Awareness on Insurance Uptake such that the effect is stronger for high age.

H3b: Age moderates the positive effect of Insurance Literacy on Insurance Uptake such that the effect is stronger for high age.

H4a: Income moderates the positive effect of Road Safety Awareness on Insurance Uptake such that the effect is stronger for high income.

H4b: Income moderates the positive effect of Insurance Literacy on Insurance Uptake such that the effect is stronger for high income.

Method

This study used quantitative research techniques and the hypotheses were tested through tools and procedures of inferential statistics. Such a research approach is relevant to achieving the essential validity and reliability of collected data. Quantitative technique is also helpful to draw inferences about the study's interest in case of Bangladesh.

Sampling

The population for the study was all of the car owners who availed "Comprehensive Coverage Policy" for their vehicle. Respondents were selected from the database of renowned insurance companies, which offer such type of insurance. Four hundred clients of Comprehensive Coverage Policy were invited to participate in the study. A simple random sampling method was followed to select the participants. As per Krejcie and Morgan (1970) standard sampling procedure, this sample size is appropriate and

substantial as it offers sufficient room for non-responses. After three reminders, 332 usable responses were received that comprised an 83% response rate.

Measurement

The survey data were collected based on a self-administered questionnaire. Survey improvements were aided by interviews with two focus groups of respondents, reviews from automobile insurance experts and extensive pretesting. The survey included questions related to insurance uptake, driving attributes, perception of accident risk, vehicle specifications, neighborhood effects, road safety awareness, and insurance literacy**.** The components were measured with a number of items particularly designed for this study. This study used a 5-point Likert scale (5 = Strongly Agree … 1 = Strongly Disagree) for measuring the extent of influence that each of the items has over the policy uptake. The average age, monthly income and education of the respondents were 35-50 (SD=.766), TK. 50000-85000 (SD=.633) and graduate (SD=.937) respectively. 30% of the respondents were female.

Analytical Tools

Data was analyzed with SPSS and SPSS AMOS, which are statistical software for multivariate data analysis. To have valid findings, data screening was performed for erroneous data items, i.e. outliers. Variables were screened through factor analysis based on their degree of correlations.

Survey Results and Analysis

Data Screening

Univariate:

- Missing Data: InsUptk 4 had two missing values and PerAccRisk6 had one, which was imputed through following the median value. Median imputation was used as both the items were categorized as ordinal variable, measured by Likert Scale. One of the control variables had values missing. The missing values (Monthly Income – 3 missing and Education – 5 missing) were imputed through using the mean, as these were continuous variable.

- Outliers: All of the considered variables in the study were measured on ordinal scale with five intervals. Therefore, there was no extreme value outlier. However,

box plot was examined for outliers in the control variables i.e. age, education, monthly income etc. Three respondents were found with exceptionally high values. Theoretically, there were no grounds to remove them and there was no reason to mark them as incorrect values. Thus, those values were simply kept as high responses

- Normality: Again, as almost all of the considered variables were measured with Likert-type scales, there was no ample justification to exclude variables based on skewness, except for the cases of no variance. Thus, the normality test was focused with kurtosis where lack of adequate variance (possibly problematic kurtosis) can be assured if the kurtosis demonstrates values less than or greater than -/+2.00. All of the variables had kurtosis values mostly in between 1 and 2. However, PerAccRisk6 and InLt3 had borderline kurtosis issues with kurtosis values of 2.23 and 2.13 (see in appendix 1). As these values were quite near to the range of -/+ 2.00, they were not excluded from the study. PerAccRisk6 and InLt3 were kept under observation for potential issues in subsequent analyses.

Multivariate Assumptions

All of the tests mentioned as under were performed after the measurement model.

- Linearity: Curve estimation regression technique was performed to test linearity of all the direct relationships in the specified model. The p-values for all the established relations were less than 0.05 (see appendix 2). The results offered sufficient evidence to consider the relationships between variables as adequately linear to be tested using the covariance based algorithm such as the one used in SPSS AMOS.
- Homoscedasticity: While putting zPred on zResid on scatter plot, all of the considered variables in the model showed a consistent relationship (linear line) between the error terms (residuals) and the predicted values of variables (see appendix 5).As the error variance was consistent with the varying values in each of the predictive variables, the considered variables were homoscedastic in nature.
- Multicollinearity: Variable Inflation Factor were simultaneously tested for all the exogenous variables (see appendix 3). As all the VIFs were less than 2.0, the exogenous variables were all distinct and there were no multicollinearity issues in the model.

Exploratory Factor Analysis

The exploratory factor analysis was conducted through Maximum Likelihood[1] (Promax Rotation method[2]) to find if the studied variables loaded together as anticipated, had adequate correlation and met reliability and validity criteria. Here each of these required analysis are presented for the finalized seven-factor model portrayed in the pattern matrix (see appendix 10).

- Adequacy: Results for the test of sampling adequacy were significant in case of the KMO and Bartlett's test (see appendix 4). Communalities of each variable were adequately high (most above 0.600 and all above 0.300) (see appendix 9). Thus, the variables were proven to be sufficiently correlated for factor analysis. In addition, the 7-factor model and its variables' adequacy were further confirmed through the reproduced matrix as it had only 1% non-redundant residuals with absolute values greater than 0.05.

- Reliability: For testing the reliability of the extracted factors, the Cronbach's alpha values were found out for respective factors (see appendix 6). Appendix 6 shows the Cronbach's alpha values correspondent to factor label and specification. All alphas were significant as they were above 0.70. As all of the indicators were essentially interchangeable and highly correlated, it can be concluded that all of the factors were reflective (Jarvis et al. 2003)

- Validity: According to Hair et al. (2010), for a sample size of 300, factors demonstrate sufficient convergent validity if their loadings are all above a minimum threshold of 0.350. Thus, the factors in the model exhibited adequate convergent validity as their loading were mostly above 0.60, with two at .555 and .593 (see appendix 10). The discriminant validity criterion was also sufficient, as there were no correlations above 0.700 in the factor correlation matrix (see appendix 7). In addition, no instances of problematic cross-loadings were found. The Goodness-of-fit Test was also significant with a Chi-Square value of 782.60 (see appendix 8).The total variance explained for this 7-factor model was 67%, where all of the extracted factors had Initial Eigen values above 1.0 (see appendix 11).

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[1]Maximum Likelihood Estimation was used for determining the unique variance among studied items and correlation between factors. It also offers a goodness of fit test for factor solution and is essential for remaining consistent with subsequent Confirmatory Factor Analysis.

[2] Promax accounts for the correlated factors and it is helpful for a relatively large (n=332) dataset.

Confirmatory Factor Analysis

- Model Fit: As all of the items were loading to a good extent, no items were removed from the model. However, the modification indices were taken into consideration for improving the model further. With consultation of modification indices, error terms of PerAccRisk3 and PerAccRisk4, VehAttr6 and VehAttr7, NGE4 and NGE5, and NGE2 and NGE4 were co-varied. Therefore, the measurement model offered an adequate level of goodness of fit in different matrices. The χ^2/df value was 1.724, which is considered as good if resides between 1 and 3. The values of Comparative Fit Index (CFI), Normed Fit Index (NFI) and Incremental Fit Index (IFI) were 0.956 (recommended >0.950), 0.902 (acceptable between 0.900 and 0.950) and 0.956 (recommended >0.900) (see appendix 12). The values of Root Mean Square Error of Approximation (RMSEA), PCLOSE and Standardized Root Mean Square Residual (SRMR) were 0.047 (recommended <0.060), 0.851 (recommended >0.050) and 0.0442 (recommended <0.090) (see appendix 12).

- Validity and Reliability: The convergent validity was tested through calculating AVE (Average Variance Extracted) where almost all of the factors demonstrated a fairly good level of validity as they had AVE above 0.50 (see appendix 13). The lowest one (0.525) in the bunch went with the first factor named as RSA. For assessing the discriminant validity, the square roots of the AVEs were compared with inter-factor correlations, found from the diagonal matrix (see appendix 13). As the diagonal values were far greater in most cases, it can be concluded that the factors exhibited sufficient discriminant validity. Composite reliability (CR) was calculated for all the factors and in line with the previous validity tests, the CR values were fairly above the minimum threshold level of 0.70 (see appendix 13). Thus, it can be concluded that the factors were reliable.

- Common Method Bias: Responses regarding the independent and dependent variables were collected through a specific questionnaire, the only survey instrument; there might be the existence of common method bias. As with Podsaloff, MacKenzie, Lee, and Podsakoff (2003), Harman's Single Factor Test was conducted to check if results of the measurement model were affected by any common method bias. Given there is common method bias, the one factor solution would load all the 35 items, used to measure the independent and dependent variables, into a single factor. According to Mossholder, Bennett, Kenney, & Wesolowski (1998), if the single factor model adequately fits the collected data, it can be concluded that common method bias is mostly responsible for explaining the relationships between variables. The total variance

explained for this single factor model was only 32.483% (see appendix 14). Moreover, the model fit indices exhibited values, such as $\chi 2$/df (9.855), CFI (0.437), NFI (0.413), IFI (0.440), RMSEA (0.164), PCLOSE (0.000) and SRMR (0.1454), which were all unsatisfactory for this single factor model (see appendix 15). Thus, it can be concluded that the single factor model did not adequately fit the data and consecutively, the existence of common method bias should not be presumed.

- Invariance Test: As the structural model was to be moderated with two categorical variables, invariance tests were conducted to assess configural and metric invariance.

  Age: The unconstrained measurement models, while loading groups separately, exhibited sufficient model fit (cmin/df = 1.611 and CFI = .945), which ascertained the model's configural invariance. Next, the chi-square difference test was found as non-significant [p value (0.061) > 0.05] when the models were constrained as equal. Hence, the measurement model was metrically invariant across age groups as well. Multi-group moderation was accomplished to test the invariance further. Using the regression weight tables of groups and the critical ratios matrix, the z-scores for individual items of a factor were calculated and it was found that almost all of the items were not significantly different (see appendix 16). Overall, the measurement model can be confirmed as invariant.

  Income: The unconstrained measurement models, with distinct loading of groups, exhibited satisfactory model fit (cmin/df = 1.508 and CFI = 0.937). Thus, the model is configurally invariant. Again, the chi-square difference test evidenced a non-significant p-value of 0.356 (more than 0.05), offering sufficient ground for metric invariance. About all the z-scores for individual items in multi-group moderation were non-significant (see appendix 17). Thus, the items under each factor did not exhibit significant differences across groups. So, the measurement model can be concluded as invariant.

Hypotheses

With controlling for Gender and Education, all of the previously stated hypotheses were examined. However, Gender and Education could potentially predict the dependent variable but they were not directly related to the study's interests. Tests for mediation were conducted without the moderators. Test for multi-group moderation were directed using the full model. These procedures were essential for having sufficient power for testing each set of hypotheses and for preserving theoretical precision and parsimony.

- *Mediation*

  H1a-d: Road Safety Awareness mediates the positive effect of Driving Attributes, Perception of Accident Risk, Vehicle Attributes, and Neighborhood Effect on Insurance Uptake.

  H2a-d: Insurance Literacy mediates the positive effect of Driving Attributes, Perception of Accident Risk, Vehicle Attributes, and Neighborhood Effect on Insurance Uptake.

- *Multi-group moderation*

  H3a-b: Age moderates the positive effect of Road Safety Awareness on Insurance Uptake such that the effect is stronger for high age.

  H4a-b: Income moderates the positive effect of Road Safety Awareness on Insurance Uptake such that the effect is stronger for high income.

Structural Equations Model

- Composite variable: The full structural model was abridged through using composite variables. Such composite variables were generated with factor scores in SPSS AMOS.

- Model fit: The initial structural model exhibited adequate fit as the values for model fit indices, such as $\chi 2$/df (1.376), CFI (0.994), NFI (0.980), IFI (0.994), RMSEA (0.034), PCLOSE (0.764) and SRMR (0.0405), were all satisfactory (see appendix 18). With consultation of modification indices, the error term of Insurance Uptake was co-varied with Driving Attributes and Vehicle Specifications. These additions between independent and dependent variables were logical in theoretical sense and perhaps, indicated a partial mediation. In order to achieve a good fit, the error terms of the mediators were co-varied as it accounted for their correlation without adding further theoretical complications to the model.

Findings

Hypothesis testing

- Mediation: The hypothesized effects of the mediating variables were tested through bootstrapping resample's technique (2000 bias corrected) in SPSS AMOS. The likely partial mediation were analyzed through comparing the direct

and indirect effects, produced while fitting the model. To test full mediation, only the indirect effects were analyzed.

- Multi-group Moderation: For testing the hypothesized effect of moderating variables, the critical ratios were calculated for differences in the regression weights amid groups. Henceforth, p-values were calculated for determining the significant differences, if any. The results are summarized below:

Mediation				
	Evidence			Mediation Type
	Direct effect without Mediation	Direct effect with Mediation	Indirect effect	
H1a: DA →RSA → IU	.310***	.281***	.057***	Partial Mediation
H1b: PAR → RSA → IU	.032 (NS)	-.030 (NS)	.020***	Full Mediation
H1c: VS→ RSA → IU	.431***	.363***	.032***	Partial Mediation
H1d: NGE → RSA → IU	-.021 (NS)	-.085 (NS)	-.085(NS)	No Mediation
H2a: DA → IL → IU	.310***	.253***	-.004(NS)	No Mediation
H2b: PAR → IL → IU	.032 (NS)	-.030 (NS)	.030 (NS)	No Mediation
H2c: VS→ IL → IU	.431***	.363***	.028***	Partial Mediation
H2d: NGE → IL → IU	-.021 (NS)	-.085 (NS)	.085 (NS)	No Mediation

Multi-group moderation

	Evidence	**Moderation Type**
H3a: Age moderates the positive effect of Road Safety Awareness on Insurance Uptake such that the effect is stronger for high age.	Age Low: 0.178*** Age High: 0.169 (NS) ΔZscore: -0.066 (NS)	**No:** No difference
H3b: Age moderates the positive effect of Insurance Literacy on Insurance Uptake such that the effect is stronger for high age.	Age Low: 0.022 (NS) Age High: 0.474*** ΔZscore: 1.813*	**Yes:** Stronger for high age

H4a: Income moderates the positive effect of Road Safety Awareness on Insurance Uptake such that the effect is stronger for high income.	Income Low: 0.176*** Income High: 0.187 (NS) ΔZscore: 0.080 (NS)	**No**: No difference
H4b: Income moderates the positive effect of Insurance Literacy on Insurance Uptake such that the effect is stronger for high income.	Income Low: 0.359*** Income High: 0.149 (NS) ΔZscore: -0.799*	**No:** Stronger for high income

Discussion

The study attempted to find out the impact of selected qualitative composite variables over the automobile insurance decisions by the vehicle owners in Bangladesh, based on a structural equations model on automobile insurance uptake. The selected variables were driving attributes, perception of accident risk, vehicle specifications, neighborhood effects, road safety awareness, and insurance literacy. Existing literature and insurance theories offered ample support behind the relationship of such qualitative variables with the insurance uptake. Mediation impacts were tested as taking the road safety awareness and insurance literacy as the mediating variables to mediate the direct effects of the other four independent qualitative variables on insurance uptake. Age and income acted as the moderating variables to judge the moderation effects on the conceptual model, taking gender and education as control variables. Data representing responses from 332 self-reported questionnaire were analyzed and study findings indicated that road safety awareness ascertained most of the mediation effects as hypotheses H1a, H1b and H1c were all accepted. Thus, road safety awareness mediates the positive impacts of driving attributes, perception of accident risk and vehicle specifications on insurance uptake. Whereas by confirming that H2c was accepted, the insurance literacy showed partial mediation for vehicle specifications and insurance uptake. However, the other three mediation test statistics were not sufficient to accept the hypotheses stated through H2a, H2b and H2d. In case of moderation, the test statistic for hypothesis H3b was significant and thus confirmed that age moderates the positive effect of insurance literacy on insurance uptake such that the effect is stronger for high age. Same was the case for hypothesis H4b and it was established that income moderates the positive effect of insurance literacy on insurance uptake such that the effect is stronger for high income. The results for other two moderation hypotheses, namely H3a and H4a, were not statistically significant. Study results also offered sufficient evidence for convergent and

discriminate validity for the structural equations model. Reliability measures were also acceptable in case of indicator reliability and internal consistency of the model.

Insights Gained

Literatures regarding the impact of qualitative variables on insurance decisions were always neglected, especially in automobile insurance. This study attempted to fill the research gap about scrutinizing the impact of qualitative factors, namely driving attributes, perception of accident risk, vehicle specifications, neighborhood effects, road safety awareness, and insurance literacy, over the automobile insurance uptake. In addition, the context of Bangladesh was highlighted in this study, which offered the impact of the stated variables' influence over insurance decisions from the perspective of Bangladeshi insurance market.

Managerial Implications and Policy Guidelines

The implications of this study for the management of insurance firms are that insurance companies need to be more careful while analyzing the decision making process of a vehicle owner. Practically, firms consider quantitative variables while assessing a vehicle owner's position in buying an automobile insurance policy. However, as this study addressed a number of qualitative variables that exposed direct as well as mediating effects over insurance uptake, insurance firms should be more conscious about considering the impact of these variables.

- Insurance companies should be optimized for checking the vehicles owners' driving attributes as well as his/her perception of accident risks. Comprehensive checklists should be prepared to assess the vehicle specifications as it has significant impact towards accidental risk.

- As the study results confirmed a good association of neighborhood effect with insurance uptake, the insurance companies should offer better service experiences for creating happy customers and instigate such insured persons to educate and refer other personnel about automobile insurance.

- Road safety awareness accounted for quite a good degree of mediation effects for automobile insurance uptake in this study. Thus, Bangladeshi insurance companies should promote such type of awareness among the vehicle owners as well as mass pubic. Promotional activities can be conducted via electronic and print media for having a far-reaching impact over the target market of automobile insurance.

- Though existing literature considers insurance literacy a prime concern for insurance uptake of any kind, findings from this study did not offer enough justification for such qualitative variable. However, insurance literacy significantly mediated the relationship of vehicle specifications with insurance uptake. Hence, proper care should be taken from the side of insurance firms to promote insurance education so that the Bangladeshi people can easily understand insurance related terms and concepts.

- Appropriate actions are also expected from insurance companies to spread insights about different types of insurance policies, formal processes, terms, and services of automobile insurance etc.

Limitations

The limitations of this study were subject to surveying vehicle owners with a relatively small sample size of 332. The generalizability of the study can be limited as the data were gathered through a convenient sampling method. In addition, an experimental study could offer better insights of the concurrent situation of the research problem.

Opportunities for Future Research

To enhance the understanding of qualitative variables' impact over automobile insurance, future research is suggested with a comparatively large number of samples. Sampling can be more clustered with large geographical dispersion to find more generalizable results. Other personal traits, behavioral attributes, psychological factors, and household related variables can be included for getting a multi-dimensional qualitative analysis. Same can be done with a mix of qualitative and quantitative variables to form a structural equations model. Field experiments can be quite useful in judging such sort of relationships and moderating variables from different perspectives can be tested.

Conclusion

Comprehensive automobile insurance policy has bright potentials as an insurance product, given proper attention and actions taken for its promotion. The primary contribution of this study was to fill the gaps in existing literature regarding the impact of some selected qualitative elements that influence automobile insurance uptake. As this study summarizes that insurance decisions of vehicle owners are significantly influenced by the a number of qualitative factors, insurance firms should offer no less importance towards such qualitative factors as compared to the quantitative ones. From the study findings, it can be generalized that the concurrent situation of comprehensive insurance policy in Bangladesh could be improved ominously if the concerned parties consider the recommended actions.

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Appendices

Appendix 1: Kurtosis

	N		Kurtosis
	Valid	Missing	
InsUptk1	332	0	-.727
InsUptk2	332	0	-.907
InsUptk3	332	0	-.913
InsUptk4	332	0	-.630
DrvAttr1	332	0	.191
DrvAttr2	332	0	-.119
DrvAttr3	332	0	.716
DrvAttr4	332	0	.108
DrvAttr5	332	0	.468
PerAccRisk1	332	0	.943
PerAccRisk2	332	0	1.380
PerAccRisk3	332	0	.848
PerAccRisk4	332	0	.957
PerAccRisk5	332	0	.672
PerAccRisk6	332	0	2.236
PerAccRisk7	332	0	-.185
VehAttr1	332	0	-.296
VehAttr2	332	0	-.251
VehAttr3	332	0	.187
VehAttr4	332	0	1.044
VehAttr5	332	0	-.486
VehAttr6	332	0	.079
VehAttr7	332	0	.054
RSA1	332	0	-.813
RSA2	332	0	-.705
RSA3	332	0	-.412
RSA4	332	0	-.927
NGE1	332	0	.909
NGE2	332	0	1.021
NGE3	332	0	.697
NGE4	332	0	1.663
NGE5	332	0	.811
NGE5	332	0	.811
InLt1	332	0	2.003
InLt2	332	0	.868
InLt3	332	0	2.139
InLt4	332	0	.815
InLt5	332	0	-.541

Appendix 2: Linearity Test

Model Summary and Parameter Estimates			
Direct relationships	R Square	F	Sig.
IL → IU	.164	64.860	.000
DA → RSA	.242	105.382	.000
PCR → RSA	.133	50.672	.000
VA → RSA	.176	70.311	.000
NGE → RSA	.052	18.028	.000
DA → IL	.073	26.033	.000
PCR → IL	.437	256.160	.000
VA → IL	.338	168.386	.000
NGE → IL	.576	448.027	.000

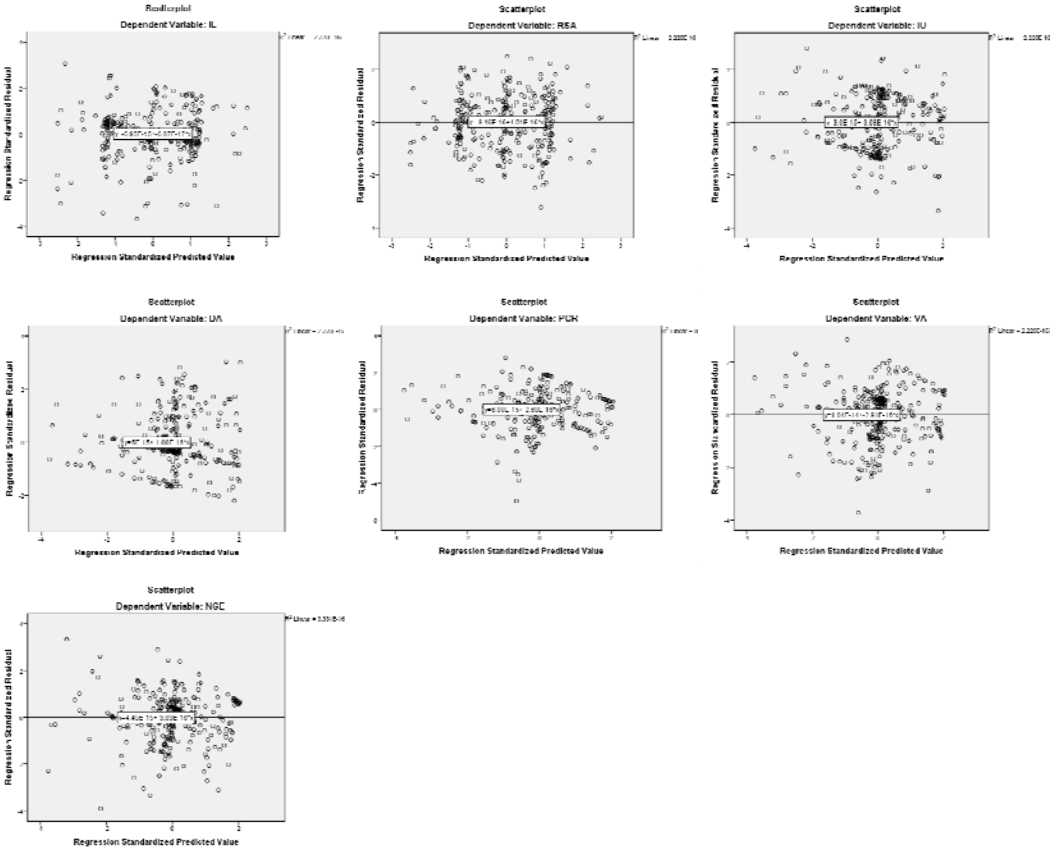
Appendix 3: Multicollinearity

Dependent variable	Independent vairable	VIF
NGE	DA	1.104
	VA	1.454
	PCR	1.456
DA	NGE	1.492
	VA	1.905
	PCR	1.755
VS	DA	1.707
	NGE	1.695
	PCR	1.093
PCR	DA	1.340
	NGE	1.103
	VA	1.348

Appendix 4: KMO and Bartlett's Test

Factor Label	Cronbach's alpha	Specification
Perception of Accident Risk	0.874	Reflective
Vehicle Attributes	0.932	Reflective
Driving Attributes	0.943	Reflective
Neighborhood Effect	0.937	Reflective
Insurance Uptake	0.815	Reflective
Road Safety Awareness	0.906	Reflective
Insurance Literacy	0.815	Reflective

Appendix 5: Homoscedasticity



Appendix 6: Cronbach's Alpha

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.919
Bartlett's Test of Sphericity	Approx. Chi-Square	9053.154
	df	595
	Sig.	0.000

Appendix 7: Factor Correlation Matrix

Factor	1	2	3	4	5	6	7
1	1.000	.501	.250	.556	.323	.305	.540
2	.501	1.000	.242	.410	.493	.354	.513
3	.250	.242	1.000	.245	.408	.435	.234
4	.556	.410	.245	1.000	.259	.182	.590
5	.323	.493	.408	.259	1.000	.405	.373
6	.305	.354	.435	.182	.405	1.000	.315
7	.540	.513	.234	.590	.373	.315	1.000

Extraction Method: Maximum Likelihood.
Rotation Method: Promax with Kaiser Normalization.

Appendix 8: Goodness-of-fit Test

Chi-Square	df	Sig.
782.602	371	.000

Appendix 9: Communalities

	Initial	Extraction
InsUptk1	.570	.547
InsUptk2	.730	.800
InsUptk3	.748	.841
InsUptk4	.509	.488
DrvAttr1	.658	.654
DrvAttr2	.731	.741
DrvAttr3	.785	.832

DrvAttr4	.748	.771
DrvAttr5	.719	.740
PerAccRisk1	.724	.682
PerAccRisk2	.792	.779
PerAccRisk3	.831	.840
PerAccRisk4	.859	.877
PerAccRisk5	.733	.696
PerAccRisk6	.641	.580
PerAccRisk7	.618	.547
VehAttr1	.602	.580
VehAttr2	.757	.737
VehAttr3	.703	.693
VehAttr4	.763	.748
VehAttr5	.707	.703
VehAttr6	.777	.731
VehAttr7	.738	.688
RSA1	.463	.527
RSA2	.522	.600
RSA3	.460	.512
RSA4	.489	.514
NGE1	.652	.621
NGE2	.676	.667
NGE3	.569	.550
NGE4	.714	.717
NGE5	.773	.837
InLt1	.610	.651
InLt2	.568	.581
InLt3	.518	.555

Extraction Method: Maximum Likelihood.

Appendix 10: Pattern Matrix

	Factor						
	1	2	3	4	5	6	7
PerAccRisk4	.957						
PerAccRisk3	.938						
PerAccRisk5	.846						
PerAccRisk1	.820						
PerAccRisk2	.800						
PerAccRisk6	.735						
PerAccRisk7	.686						
VehAttr6		.891					
VehAttr5		.871					
VehAttr2		.869					
VehAttr4		.854					
VehAttr3		.802					
VehAttr7		.791					
VehAttr1		.669					
DrvAttr3			.935				
DrvAttr5			.882				
DrvAttr4			.877				
DrvAttr2			.855				
DrvAttr1			.741				
NGE5				.947			
NGE4				.839			
NGE1				.798			
NGE2				.758			
NGE3				.555			
InsUptk3					.953		
InsUptk2					.945		
InsUptk1					.604		
InsUptk4					.593		
RSA2						.766	
RSA3						.735	
RSA1						.711	
RSA4						.669	
InLt1							.749
InLt2							.684
InLt3							.624

Extraction Method: Maximum Likelihood.
Rotation Method: Promax with Kaiser Normalization.[a]

a. Rotation converged in 6 iterations.

Appendix 11: Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	12.147	34.705	34.705	11.735	33.529	33.529	8.670
2	4.110	11.743	46.449	3.758	10.736	44.265	8.427
3	3.068	8.765	55.214	2.776	7.933	52.197	5.558
4	2.163	6.181	61.395	1.840	5.258	57.455	7.035
5	1.741	4.974	66.370	1.408	4.023	61.478	5.841
6	1.643	4.694	71.063	1.393	3.981	65.459	4.713
7	1.057	3.021	74.084	.715	2.043	67.502	6.679

Extraction Method: Maximum Likelihood.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Appendix 12: Model Fit

Metric	**Observed value**	**Recommended**
cmin/df	1.724	Between 1 and 3
CFI	0.956	>0.950
NFI	0.902	Acceptable between 0.900 and 0.950
IFI	0.956	>0.900
RMSEA	0.047	<0.060
PCLOSE	0.851	>0.050
SRMR	.0442	<0.090

Appendix 13: Validity and Reliability

	CR	AVE	RSA	PCR	VA	DA	NGE	IU	IL
RSA	0.816	0.525	0.725						
PCR	0.942	0.700	0.325	0.836					
VA	0.936	0.675	0.372	0.514	0.822				
DA	0.935	0.741	0.439	0.255	0.252	0.861			
NGE	0.905	0.657	0.196	0.592	0.452	0.240	0.810		
IU	0.880	0.650	0.397	0.314	0.484	0.401	0.263	0.806	
IL	0.820	0.604	0.323	0.598	0.524	0.242	0.685	0.361	0.777

Appendix 14: Harman's Single Factor Test (Total Variance Explained)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.147	34.705	34.705	11.369	32.483	32.483

Extraction Method: Maximum Likelihood.

Appendix 15: Harman's Single Factor Test (Model Fit)

Metric	**Observed value**	**Recommended**
cmin/df	9.855	Between 1 and 3
CFI	0.437	>0.950
NFI	0.413	Acceptable between .90 and .95
IFI	0.440	>0.900
RMSEA	0.164	<0.060
PCLOSE	0.000	>0.050
SRMR	.1454	<0.090

Appendix 16: Invariance test (Multi-group moderation - Age)

			AgeHigh		AgeLow		
			Estimate	P	Estimate	P	z-score
PerAccRisk3	<---	PAR	1.016	0.000	0.968	0.000	-0.759
PerAccRisk5	<---	PAR	1.017	0.000	0.91	0.000	-1.165
PerAccRisk1	<---	PAR	0.926	0.000	1.023	0.000	1.049
PerAccRisk2	<---	PAR	0.985	0.000	1.053	0.000	0.777
PerAccRisk6	<---	PAR	0.962	0.000	0.842	0.000	-1.211
PerAccRisk7	<---	PAR	0.801	0.000	0.823	0.000	0.224
VehAttr5	<---	VS	1.127	0.000	1.129	0.000	0.018
VehAttr2	<---	VS	1.244	0.000	1.168	0.000	-0.569
VehAttr4	<---	VS	1.19	0.000	0.971	0.000	-1.856*
VehAttr3	<---	VS	1.175	0.000	1.069	0.000	-0.811
VehAttr7	<---	VS	0.891	0.000	1.002	0.000	1.273
VehAttr1	<---	VS	1.096	0.000	0.988	0.000	-0.79
DrvAttr5	<---	DA	1.046	0.000	0.92	0.000	-1.441
DrvAttr4	<---	DA	1.154	0.000	0.933	0.000	-2.547**
DrvAttr2	<---	DA	1.194	0.000	1.057	0.000	-1.391
DrvAttr1	<---	DA	1.157	0.000	0.884	0.000	-2.66***
NGE4	<---	NGE	0.951	0.000	0.923	0.000	-0.323
NGE1	<---	NGE	0.977	0.000	0.972	0.000	-0.038
NGE2	<---	NGE	0.948	0.000	1.004	0.000	0.531
NGE3	<---	NGE	0.786	0.000	0.939	0.000	1.343
InsUptk2	<---	IU	0.999	0.000	0.927	0.000	-0.815
InsUptk1	<---	IU	0.785	0.000	0.771	0.000	-0.136
InsUptk4	<---	IU	0.76	0.000	0.674	0.000	-0.871
RSA3	<---	RSA	0.785	0.000	1.199	0.000	2.323**
RSA1	<---	RSA	0.82	0.000	1.194	0.000	2.141**
RSA4	<---	RSA	0.914	0.000	1.14	0.000	1.266
InLt2	<---	IL	0.916	0.000	1.056	0.000	0.998
InLt3	<---	IL	0.889	0.000	0.858	0.000	-0.247

Notes: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10

Appendix 17: Invariance test (Multi group moderation - Income)

			IncomeHigh		IncomeLow		
			Estimate	P	Estimate	P	z-score
PerAccRisk3	<---	PAR	1.042	0.000	0.967	0.000	-1.133
PerAccRisk5	<---	PAR	1.084	0.000	0.909	0.000	-1.784*
PerAccRisk1	<---	PAR	1.057	0.000	0.941	0.000	-1.199
PerAccRisk2	<---	PAR	0.967	0.000	1.045	0.000	0.854
PerAccRisk6	<---	PAR	0.891	0.000	0.901	0.000	0.094
PerAccRisk7	<---	PAR	0.831	0.000	0.798	0.000	-0.323
VehAttr5	<---	VS	1.24	0.000	1.072	0.000	-1.239
VehAttr2	<---	VS	1.202	0.000	1.205	0.000	0.026
VehAttr4	<---	VS	1.027	0.000	1.096	0.000	0.606
VehAttr3	<---	VS	0.988	0.000	1.188	0.000	1.548
VehAttr7	<---	VS	1.01	0.000	0.928	0.000	-0.962
VehAttr1	<---	VS	1.028	0.000	1.039	0.000	0.081
DrvAttr5	<---	DA	0.991	0.000	1.001	0.000	0.106
DrvAttr4	<---	DA	1.091	0.000	1.039	0.000	-0.591
DrvAttr2	<---	DA	1.05	0.000	1.201	0.000	1.455
DrvAttr1	<---	DA	1.032	0.000	1.034	0.000	0.013
NGE4	<---	NGE	0.906	0.000	0.96	0.000	0.627
NGE1	<---	NGE	0.962	0.000	0.98	0.000	0.156
NGE2	<---	NGE	0.906	0.000	1.017	0.000	1.066
NGE3	<---	NGE	0.787	0.000	0.893	0.000	0.95
InsUptk2	<---	IU	1	0.000	0.939	0.000	-0.704
InsUptk1	<---	IU	0.762	0.000	0.796	0.000	0.344
InsUptk4	<---	IU	0.668	0.000	0.751	0.000	0.844
RSA3	<---	RSA	0.916	0.000	0.981	0.000	0.386
RSA1	<---	RSA	1.024	0.000	0.968	0.000	-0.333
RSA4	<---	RSA	1.126	0.000	0.925	0.000	-1.147
InLt2	<---	IL	0.937	0.000	1.037	0.000	0.726
InLt3	<---	IL	0.849	0.000	0.871	0.000	0.172

Notes: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10

Appendix 18: Structural Equations Model (Model Fit)

Metric	Observed value	Recommended
cmin/df	1.376	Between 1 and 3
CFI	0.994	>0.950
NFI	0.980	Acceptable between 0.900 and 0.950
IFI	0.994	>0.900
RMSEA	0.034	<0.060
PCLOSE	0.764	>0.050
SRMR	0.0405	<0.090