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Focus Group And Structural Equation Model Based Determination of Influence of Life Events In Triggering Purchase of Automobile Products For Different Age Groups of Indian Customers

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ABSTRACT

During occasions like marriage, birth of a newborn, housewarming celebrations etc. purchase of luxury products is quite common in India. It has been seen from a few literary evidences collecting samples from different countries in the world that automobile product purchase intention triggered by life events, varies among different age groups across the countries. Therefore, investigating the same in Indian context is worthwhile because it has been inadequately explored and established as a literature gap. In this research work, we have conducted focus group discussions to identify the life events that may encourage people of India belonging to different age groups to undergo the transition from zero-ownership state to one-ownership state. Then cluster analysis is performed to find out age groups with distinct choice of events suitable for purchase of automobiles. Subsequently, for each such group, separate structural equation models are proposed to demonstrate influence of each life event on automobile purchase intention of Indian customers.

Keywords: Automobile Purchase Intention (API), Cluster analysis, Correlation analysis, Focus group interviews, India, Structural equation models.

INTRODUCTION:

Automobile purchase intention (API) of consumers depend upon personal, social, psychological, situational, demographic and physical, factors which influence their thoughts and feelings. Research has established that these feelings differ across various countries, societies , cultures and subcultures (Clark et. al. (2014), Oakil et. al. (2016). Aspirational social reference groups develop a perception of ideal lifestyle in minds of potential customers and create peer pressure to signal rising in social status especially after events like getting a new lucrative job, promotion or driving license (Prillwitz et. al.(2006)). Peer pressure is an antecedent of automobile purchase intention (Podoshen (2012), Oakil et. al. (2016)) as per social cognitive theory which specifies that social norms and the urge to gain acceptability have significant impacts on API of people. Literature on API advocates for statistical association between life events like relocation, promotion, job, childbirth, increase in number of adult family member etc. in context of various countries in the world (Clark et. al. (2016), Oakil et. al. (2016), Prillwitz et. al.(2006)) although findings are contradictory in many cases. The role of events differ in different societies and also people react diversely to the stress that generates out of new responsibilities and behavioral efforts to adapt to new external situations, shocks, expectations and requirements (Clark et. al. (2016)), stress arises not just from the efforts to adequately cope up with demands and threats to well-being, but also from lack of equilibrium yielding from newly arriving at a desirable social state. This stress may either stimulate a person to buy personal vehicles to control the otherwise Uncontrolled environment or make him/her scrupulous enough to strategically allocate resources and find alternatives to save money (Durante et. al. (2016)).

Purchasing under stress may sometimes be driven by impulse and sometimes by cognitive reasoning when a potential consumer is meticulous enough about his resources and requirements. Impulsive purchase is either based on limited problem solving or habitual decision making method (Huang et. al. (2022)). Sudden increase in disposable income often leads to impulsive buying of luxury products (Amel et. al. (2013)) and therefore events like getting a new Job or promotion may stimulate a person to buy automobiles. This is supported by the sociological model of consumer behavior which depicts that luxury products are purchased to impress others and stand out from the crowd especially during social occasions (Dhanabalan et. al. (2018)). Veblen's theory of leisure class resonate with this by accentuating the fact that functional value of a luxury product is less important than it's conspicuous counterpart and satisfaction is derived out of the display of wealth (Jain, Roy, Ranchod (2015); O'class and Frost (2004)), especially in social occasions to convey an individual's image and personal

taste (Mason (1993)). The intention is to exhibit magnificence, uniqueness, opulence and extravagance (khan, 2000).

In India, gorgeous social functions are organized during events like marriage, childbirth etc., where people get a platform to demonstrate distinctiveness and sense of fashion through acquisition of premium and luxury products (Jebarajakirti, Das (2021), Venkatesh, Morris(2000)). Since automobile is a luxury product and urge to gain social acceptance is an antecedent of it's purchase, life events like marriage, childbirth etc. may encourage people to buy private vehicles in Indian scenario, although there are inadequate evidences in support of the claim. Shifting habitat to a new geographical location is not necessarily associated to increased income. Therefore, this event may lead to cognitive reasoning based purchase of automobiles where resources and requirements are carefully considered by a potential purchaser. This is supported by Mashlow's hierarchy of needs theory, where different types of needs are considered. Events like relocation generate changed needs which may encourage a potential customer's inclination towards purchase of automobiles although there are scanty evidences in support of the statement in Indian scenario.

All these substantiate the fact that impact of life events on API of Indian customers have been inadequately explored in relevant literature and hence it is a literature gap. In this article, we address the above mentioned gap with the intention to contribute in consumer purchase theory and managerial practices. Here we propose a detailed study of the impact of key life events on API of Indian Customers, belonging to various age groups. Investigation of API with respect to age groups is indispensable here because importance of such key events for a youngster at 20 is bound to be different from an experienced senior at 60 (Silva, 2015). First we conduct a focus group discussion to identify the key events that encourage an Indian customer to buy an automobile product so that transition happens from 0-ownership state to 1-ownership state. Then we perform cluster analysis to divide the entire pool of focus group participants between 18 and 76 years into sub-groups with distinct key events triggering API. After that, structural equation models are proposed corresponding to each group to empirically illustrate the influence of every relevant factor on API.

2. RELATED WORK AND FORMULATION OF HYPOTHESES

2.1 Life events as antecedent of API

Acquisition of an automobile product brings noticeable change in lifestyle of members of a household. Therefore a prediction of resources and change in mobility practices of members expected to provide an impetus for purchase of personal vehicles to lead a comfortable life and gain social appraisal ((Clark et.al. (2016)). Whelan (2007) came up with the finding that ruralized residential locations higher income and acquiring driving license increase purchase intention of automobiles among people of Great Britain. Dargay and Hanly (2007) demonstrated that change in personal vehicle ownership level is more prevalent in families which have experienced a recent life event compared to those which haven't experienced that in last one year based on a retrospective study conducted in Utrecht (Netherlands). Meelen and Munzel (2023) claimed that life events trigger API where private vehicles are purchased either simultaneously or immediately before or after the life events. Birth of a child is found to be associated to acquisitions in anticipation of the event whereas promotion or newjob trigger a purchase after actual occurrence of the event. Zhang et. al. (2014) performed a study in Japanese households, which reveals that residential relocation is the most influential event that promotes API whereas getting a new job or educational changes demonstrate negligible effect.

Lanzendorf (2010) conducted a quantitative examination which revealed that "some new mothers were shown to decrease their inclination on cars, challenging the assumption that chance of car purchase universally increase following childbirth". Prillwitz et. al. (2006) experimented in Germany to come up with the finding that beside household status variables, key events strongly impact API. Those are "changing number of adults in a household, birth of a child, change in weighted monthly income and change in residence from one core area to another. Khan et. al. (2021) presented a biographical approach to analyze households' vehicle ownership states and type choice using retrospective survey data from Halifax, Canada. He found that along with vehicle attributes, both life stage transitions and life events are strong predictors of changing vehicle ownership, both for households with no-car ownership state and transient ownership state. Rashidi and Mohammadian(2011) developed a risk duration modeling framework to establish that household states and location characteristics change vehicle ownership. Change in household income, retirement, vehicle attributes and number of adults have been highlighted by Mohammadian and Miller (2003) as antecedents of API.

As far As literary evidences from India are concerned, there are only a few articles that give hint on probable influences of life events on automobile purchase intention of consumers (Borthakur (2023)). The rule of income level and lifestyle has been emphasized by (Kesavan S., Vijayabanu C., Ramachandran A.(2012)), Renganathan (2005), Devi(2015)). These authors further elaborate that family income rises when its members get job or promotion; along with that improvement in lifestyle is also expected. This creates an emotional need in Indian societies to show of wealth and signal rising in society status (Huang et. al. (2022), Bearden et. al. (1990)). According to (Huang et. al. (2022), Gokhale, Veluchamy, Mishra (2021)), lifestyle and social pressure are factors that stimulate API. Subadra et. al. (2010) performed a study at Namakkal district of Tamil Nadu, India, to understand perceptions and purchase behavior of private vehicle owners. She found that income and family size are to prominent factors in influencing automobile purchase intention of potential customers. Marriage and childbirth both are life events that increase number of family members. Therefore, these events may have an impact on

API of consumers. New employment or promotion of family numbers increase family income, which, in turn stimulate consumers to own new vehicles, even when they are already vehicle owners. Summarizing conclusions of the study's mention of above, We arrive at the below-mentioned list L1 of life events that may have non-negligible impacts on automobile purchase intention of potential customers.

Increase in family income.

Increase in number of adult family members.

Childbirth

Retirement

Relocation of house

Acquiring of driving license.

Advancement in education was also examined as a probable antecedent of API by Zhang et. al (2014), although it was ultimately found to be insignificant. The role of life events on automobile purchase intention of Indian customers have not been adequately explored in literature. Out of the articles that focus on factors of API in general, the following list L2 of events may play a major role in stimulating their API.

Increase of family income

Increase in number of family members.

Since L2 is a subset of L1, we examine influence of events of L1 in context of API of Indian customers. To be more specific, family income may increase during events like new employment and promotion. Marriage is the most common occasion in Indian society through which adult members are added to families. Along with these events, we also examine childbirth, retirement, relocation of house, acquiring driving license and advancement in education.

2.2 Variable importance of life events for different age groups

Impacts of above antecedents of API mentioned in section 2.1, are expected to be different for different age groups because retirement stands little chance to be a criterion of API for potential young customers. Similarly, advancement in education may not trigger API for youngsters although a new job may do. Hence, we study effects of these influencers for different age groups using survey questionnaires where important events for each group are determined from clusters of responses. In the literature of automobile purchase, age is an important demographical antecedent. Among the few articles that studied automobile purchase intention or API of young people, the one by Huang et al.(2022) is mention-worthy in the context of China. The authors have divided young people in three groups – early youth (18-22 years), middle youth (23-28 years) and later youth (28-35 years). Difference between their automobile purchase intention is statistically significant. The youngsters belonging to early youth stage have very low API because of their inclination to low cost public transport. Next group express purchase intention but they have lack of fund. People belonging to the group 28-35 years purchase cars mostly during marriage. Therefore in Chinese society, marriage has been mentioned as an important event to buy automobile products, at least for the age 28-35 years. APIs of the age groups 31-35 years, 36-40 years, 41-45 years and 46-50 years of people belonging to United States, are investigated by Mo and Wong (2020). They found that young customers have a higher API and they prefer to purchase cars mostly after relocating houses. Here relocation is mentioned as an event. Just the opposite picture has been portrayed by Patterson (2007) in context of Australian society which revealed that automobile purchase intention increases with age because of the increased income. However, importance of life events is not mentioned here. Yan et al. (2022) conducted a study in China where many youngsters expressed inclination to private transport especially after the outbreak of covid-19.

Potential changes in travel behavior due to relocation of houses has been advocated by some authors (Bamberg, Hunecke, Blobaum(2007); Krizen (2003); Scheiner et.al.(2005); Stanbridge , Lyon., Farthing(2004)). According to Bamberg, Hunecke and Blobaum (2007) significant change of travel trajectory, increase peoples' dependence on personal vehicles, encouraging them to buy one. On the other hand, Scheiner et.al.(2005) proposed a sociological dynamic migration model where a strong relevance of spatial structures is established on travel behavior. Blotevogel and Jeschke (2003) conducted a study at Ruhr in Germany which shows that transport related experiences, distance to workplace and infrastructure issues are much less important compared to life events. The events specified by them are marriage and new job. However, no discussion has been performed on age group. It may please be noted that societies in foreign countries are different from India and therefore importance of these events may differ across various age groups of Indian population (Bhatnagar, 2017; Reddy, 2017). This is a literature gap which we target to fulfill in this research.

2.3 Formulation of Hypotheses

The events we consider here are marriage, new job, promotion, relocation, retirement, advancement in education, acquiring a driving license and childbirth. Below we discuss each of these in line with relevant theory to formulate hypothesis for testing their influence on automobile purchase intention of Indian customers.

Marriage

Marriage is defined as union between a man and woman which is recognized by society as basis of a family. It accomplishes inclusion of a new adult member in the spouse's family and creates opportunities for

establishment of permanent rights over other's resources (Wimalasena (2016)) as per rules of the society. As a result the family becomes bigger and may generate requirements for more or bigger resources. Based on Mashlow's hierarchy of needs theory, Jisana (2014) argued that family is one of the strongest influential factors in decision making especially when husband-wife and children buy a car. Impact of family size on API has also been supported by Shende (2014). Pongjitpak(2021) conducted a study in Thailand about influencers of used luxury car purchase behavior, in which he found that customers often buy these cars to impress their spouse and loved ones. In India, there is a custom for extended celebration of marriage where many people get together approximately for 4 days, providing an ideal platform for manifestation of status and higher economic position in front of friends, relatives and neighbors (Dupor, Liu (2003)). Automobiles are highly preferred in this respect because these are visible hedonic commodities and auto loans can be easily obtained (Corneo, Jeanneo(1999)). Therefore, marriage as a life event that may trigger purchase of automobiles in Indian societies. On contrary to this, marriage increases the tendency of saving money among youngsters (Fulford (2013)), Palriwala et. al. (2008)). which should prevent them from buying hedonic luxury products like automobile. This gives rise to the following hypothesis:

H1: Marriage increases API among Indian customers.

New job and promotion

New employment in a family or promotion of a member increase it's weighted monthly income and rise in income has been portrayed as a strong influencer of API of people belonging to countries like Belgium (Dargay (2001), India (Shende (2014), England (Gately (1999)) etc. Although customer behavior related theories do not explicitly mention the rule of "rise in income" in shaping purchase intention of automobiles but influence of "income" has been enthrusted by Veblenian social-psychological model. Therefore newjob and promotion may influence API of Indian customers. This contradicts the Keynesian Function which establishes that arrange propensity to consume falls and average propensity to save rises, with increase is income (Gersovitz(1988)). Reduction of propensity to consume is supposed to reduce API.

This gives rise to hypothesis H2 and H3.

H2: Newjob increases API among Indian customers.

H3: Promotion increases API among Indian customers.

Relocation of house

Residential location is a contextual factor that promotes API of customers (Stag et. al. (2001), Yan et. al. (2022)). Changing the house is an event which changes a residential location. Attributes, advantages, rules and regulations, security related needs, applicable govt. policy, availability and standard of alternative transport, road infrastructure, population density (Gomez et. al. (2018)) of the new location may be different from the old one. Among these, govt. policies, rules and regulations (Pirzada, Singhi (2018), traffic conditions (Guckenheimer(1999)) and security needs (Yan et. al. (2022)) can stimulate purchase of automobiles. This is also supported by social cognitive theory, Mashlow's hierarchy of needs theory and Freudian Psycho-analytical model (Mo, Ming (2020); Yan et. al. (2022)). Therefore, relocation of house may positively impact automobile purchase intention of customers in India. This is, however, opposed by the relation between uncertainty in growth of consumption at new residential location and saving tendency (Christelis et. al. (2016), Skinner (1998), Kimball(1990)). Young potential consumers tend to increase precautionary saving to cope up with uncertain or estimated growth of consumption after relocating house (Kimball(1990)). This is supposed to reduce API. Based on these contradictions, we develop our hypothesis H4 in Indian scenario.

H4: Promotion increases API among Indian customers.

Retirement

Immediately after withdrawing oneself from occupation, a huge amount of money suddenly comes in hand which sometimes encourage extravaganza (Clark et. al. (2016)). More flexible leisure routines and increase in need of physical comfort often lead to acquisition of additional private vehicles (Clark et. al. (2016), Chamonix et.al. (2008)).

This is supported by Veblen's socio-psychological model and Mashlow's hierarchy of needs model. Contrary to this, fear of uncertain expenses may increase saving tendency of retired persons (Zaman (2013)). All these findings lead to the following hypothesis.

H5: Retirement increases API among Indian customers.

Childbirth

Birth of a new child increases family size which yields a positive impact on automobile purchase intention of customers as argued by Shende (2014) and Clark et. al. (2016). The new requirement to easily transport the child sometimes triggers API and this is supported by Mashlow's hierarchy of needs theory. On the other hand birth of a new child increases responsibility of parents which may encourage them to cut cost and save money. (Hytti et. al.(2015), Sonfield et. al. (2013). These findings oppose each other and give rise to hypothesis H6.

H6: Childbirth increases API among Indian customers.

Advancement in education

Advancement in education may or may not need relocation. If the new course(s) will be studied from a different institution and habitat needs to be shifted, then relocation may trigger API for easy and comfortable transportation where need for comfort influences purchase Intention and advancement in education as an event, generates the need (Yan et. al. (2022)). However, enrolling into a new course inevitably incurs additional expenses which may stimulate the tendency to save (Kimball(1990)). These contradictory findings give rise to H7.

H7: Advancement in education increases API among Indian customers.

Acquiring a driving license

A rule of driving license in triggering API, has found to be insignificant by Clark et. Al.(2016) and Yan et. al.(2022). Also, we did not find enough evidences in literature to advocate for non negligible impact of "acquiring driving license" on API. Still, from practical point of view, people learn driving either to become a driver by profession or to drive own personal vehicle. Moreover, comfort driving has been mentioned as an antecedent of API (Najeemudeen and Panchanathanam(2014), Lunia and Verghese(2013), Vidyavathi(2012)). Such findings are supported by Pavlovian learning model and Mashlow's hierarchy of needs theory where need for physical comfort has been highlighted. Hence, there may be some relation between a driving license and automobile purchase intention which gives rise to hypothesis H8.

H8: Acquiring a driving license increases API among Indian customers.

We test the above hypotheses for different age groups after collecting their responses and clustering those.

2.3 Organization of The Article

Overall methodology is illustrated in section 3. In section 4 we collect responses of people belonging to different age groups through focus group discussions regarding life events in which an automobile might be brought. Section 5 divides all the opinions into certain clusters and section 6 proposes structural equation models for each cluster derived in section 5. Section 7 concludes the paper.

3. CONCEPTUAL FRAMEWORK AND METHODOLOGY

Conceptual framework appears in section 3.1 whereas methodology is shown in 3.2.

3.1 The Conceptual Framework

Fig 1 illustrates conceptual framework of the system where the potential life events that may be responsible for purchase of a private vehicle (as mentioned in L1), are passed through the age-based event filter (AEF) which determines antecedent-events influential for different age groups of customers. Our intention is to determine weights of each such event to understand their importance in triggering automobile purchase in context of India.

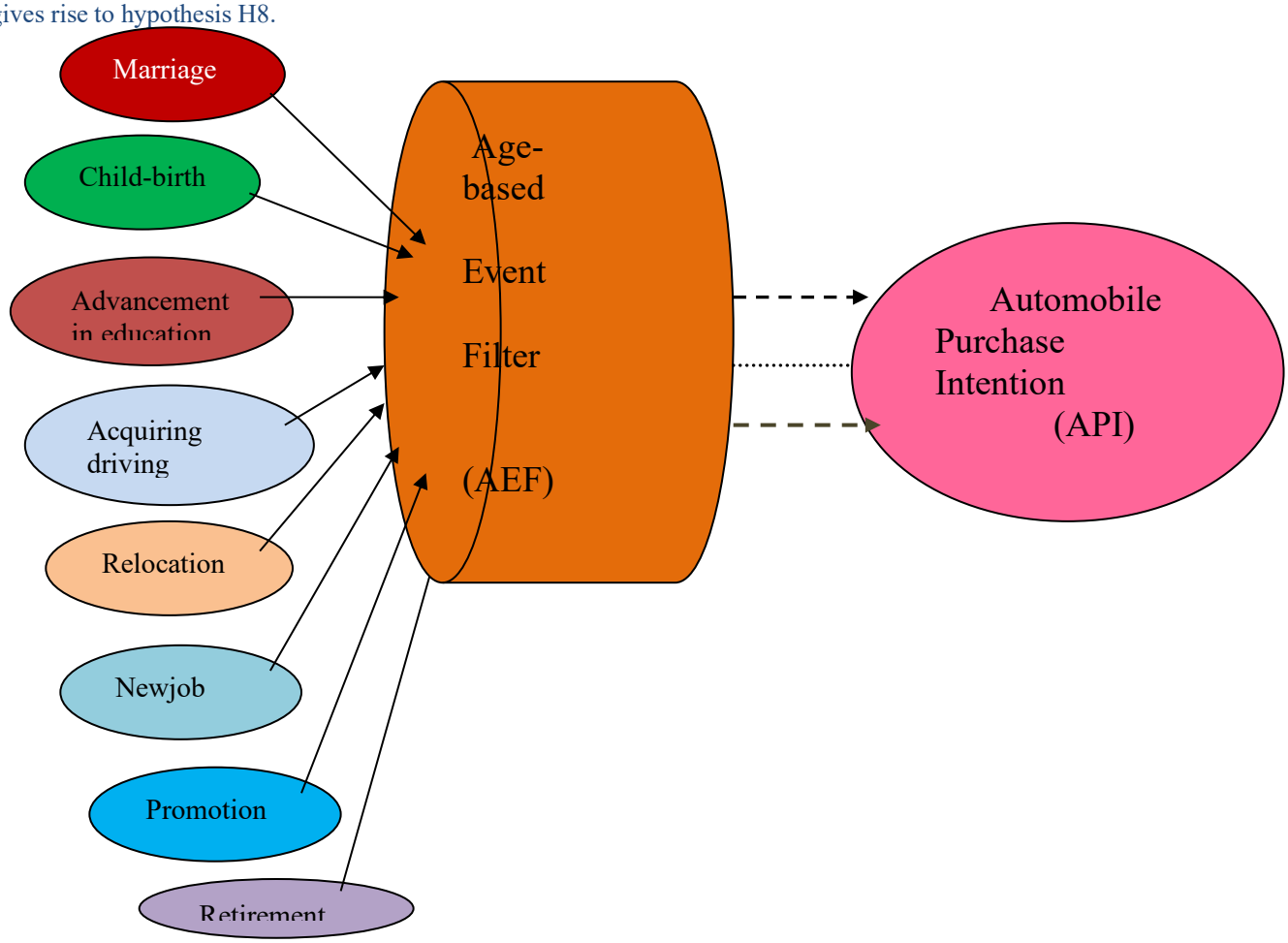

Fig. 1: Conceptual framework of our proposed scheme

The list of antecedent-events L1 have been derived from literature review. In order to find out importance of each event for different age groups, focus group discussions have been conducted to collect the responses and subsequently clustering is applied to find out various groups with diverse opinions. It is detailed in the methodology subsection below (subsection 3.2).

3.2 Methodology

The methodology appears in fig. 2. At first, focus group interviews are conducted to collect as many opinions as possible on the relevant subject. Then summary of thoughts of all groups are assembled together for cluster and correlation analysis. At the beginning of cluster analysis phase, elbow method is applied to know optimum number of cluster and subsequently K-means clustering is applied to divide or subgroup the entire set of focus group responses into those many number of clusters. In fig-2 it has been assumed that number of clusters is n. For each such cluster, correlation analysis is performed to identify the key events that are highly correlated. Among those only one is selected for next phase while the other one is eliminated. Then based upon unique sets of key events of each cluster, separate sets of survey questions are designed and responses are collected. Subsequently the survey responses are analyzed and structural equation models are proposed for all groups which determine weights of all key events in API of consumers belonging to various age groups.

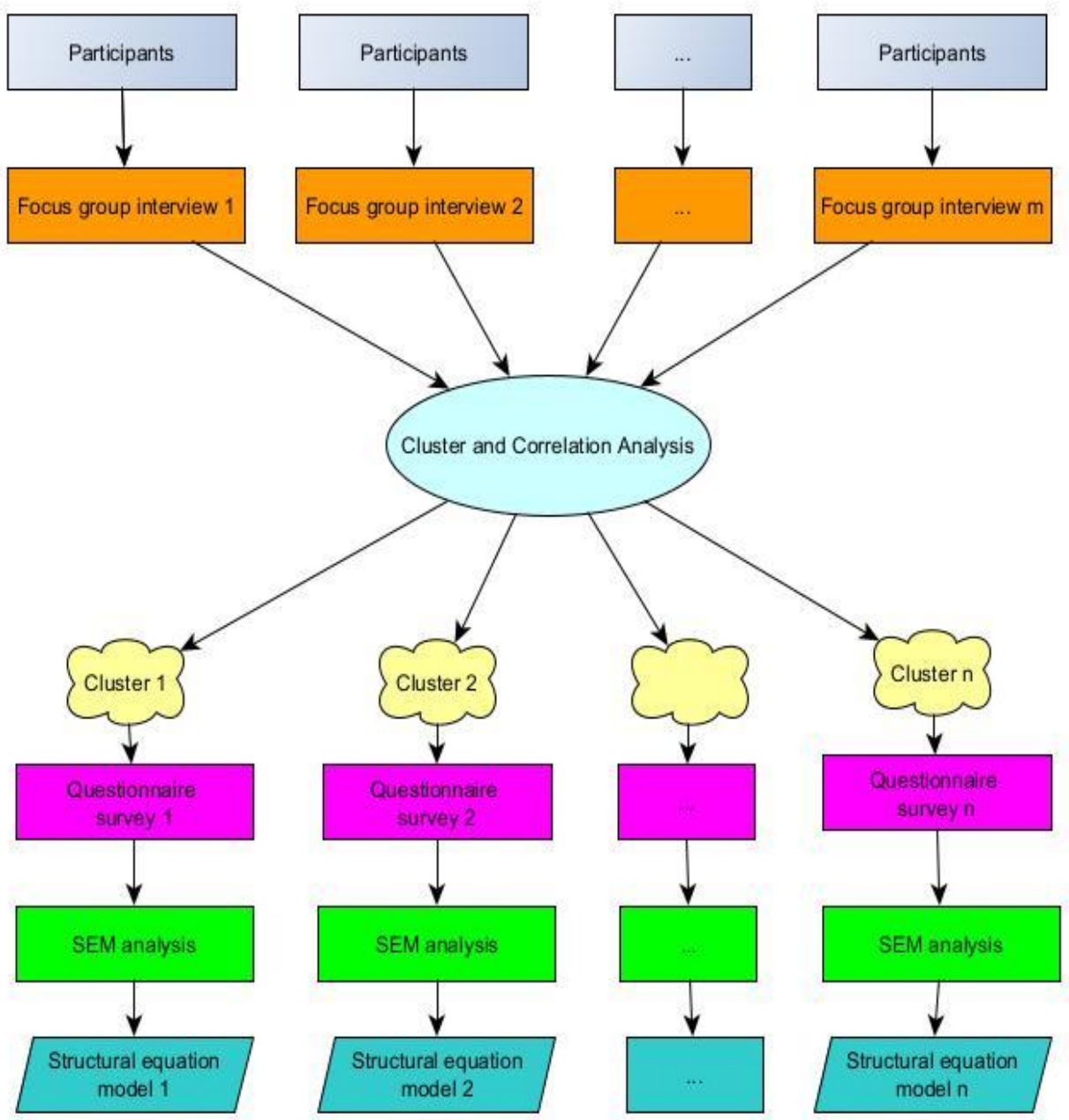

Fig 2: Overall methodology

4. FOCUS GROUP DISCUSSION ABOUT KEY EVENTS

The process of recruiting the participants is presented in section 4.1 while process of conducting the interview is illustrated in 4.2. Section 4.3 discusses about other insights that come out of it.

4.1 Recruiting The Participants

The group of participants were chosen from

Students and faculties of various branches in an university.

Doctors in a local hospital.

Employees of the local municipality.

Nearby branch offices of two banks.

Local police station

Employees in nearby office of an MNC.

Sixty focus groups were constructed each consisting of 8-12 participants. Small groups were constructed so that each member can have adequate time to express his/her opinion. Minimum and maximum ages of participants were 18 and 76. Ages of first year students in the university were 18 whereas some of the senior advocates were aged close to 76. Others were within the range 18-76.

4.2 Conducting The Interviews

Interviews were conducted in offline mode with the help of a moderator. All participants gave consent to record the entire conversations. Important observations, immediate facial reactions etc. were separately noted on paper. The questions that were asked are shown in fig-2 in the form of a flowchart. Initially each participant is asked about his favorite life events which he wants to celebrate with his family, friends and relatives. For each life event or occasion that has been mentioned by a focus group participant, questions are asked based on earlier responses. Outcome of the focus group is a set of key events or occasions and responses of participants with respect to these occasions. Each interview went on for approximately forty five minutes. The questions asked in the focus group are numbered from Q1 to Q37, as shown is table 1, where question dynamics appear in fig 3.

Table 1: List of questions asked in focus groups

Question number	Statement
Q1	Are you currently an employed person?
Q2	Would you like to buy a vehicle if your income increases suddenly and substantially?
Q3	Do you have any plan to buy a vehicle after retirement? Why?
Q4	After getting the first job would you like to go for a luxurious purchase like automobiles?
Q5	Have your parents or guardians ever told you about buying you vehicle after you get the first job?
Q6	Who told you and when? Can you remember?
Q7	What's your relationship status now, single or married?
Q8	Do you have any plan to buy a fake private vehicle on the eve of your marriage?
Q9	Is it for the family requirement or impressing the spouse or others?
Q10	Do you expect to be gifted a private vehicle on the eve of your marriage?
Q11	From whom do you expect question marks parents, grandparents, in-laws, spouse, friends or somebody else?
Q12	Suppose after marriage or getting a new job, you have to shift your residents to a new location. What will be your favourite mode of transport over there – public or private?
Q13	Can you please describe a reason behind your favourite mode of transport in the new location?
Q14	Do you have children?
Q15	Are they aged above 18 years?
Q16	According to you is private transport the best mode of transport for safe and secure journey of babies?
Q17	Are you currently enrolled in an educational course?

Q18	How do you go to the institution?
Q19	Do you intend to buy a personal vehicle up after end of the current course?
Q20	Have your parents ever told you about buying you a private vehicle to facilitate your journey to and from the institution?
Q21	Have they ever mentioned about buying you the same after completion of the course?
Q22	Do you have a driving licence?
Q23	Are you currently learning to drive?
Q24	Would you like to buy a personal vehicle after acquitting it?
Q25	Did you buy a personal vehicle after clearing it?
Q26	Have you ever thought of buying cars or bikes for your children to encourage in further studies? Why?
Q27	Would you love to give to the same on the eve of their marriage?
Q28	Do you think it is necessary unnecessary?
Q29	Do you have any plan to gift your family's youngsters a private vehicle after they get a job?
Q30	Would it pamper them unnecessarily?
Q31	Suppose after marriage or after getting a new job they think of shifting their residence. In that case would you buy them a private vehicle? Why?
Q32	Do your children know driving?
Q33	Are there presently learning it?
Q34	Will you buy a vehicle for them after they get the driving licence?
Q35	Suppose one of your children gets a promotion. Do you believe that the occasion is important enough to be celebrated with purchase of a car or bike?
Q36	Will your old age insecurities interfere with the above-mentioned purchase?
Q37	Suppose there is birth of a little child in your family. Would you like to buy a vehicle in this event? Why?

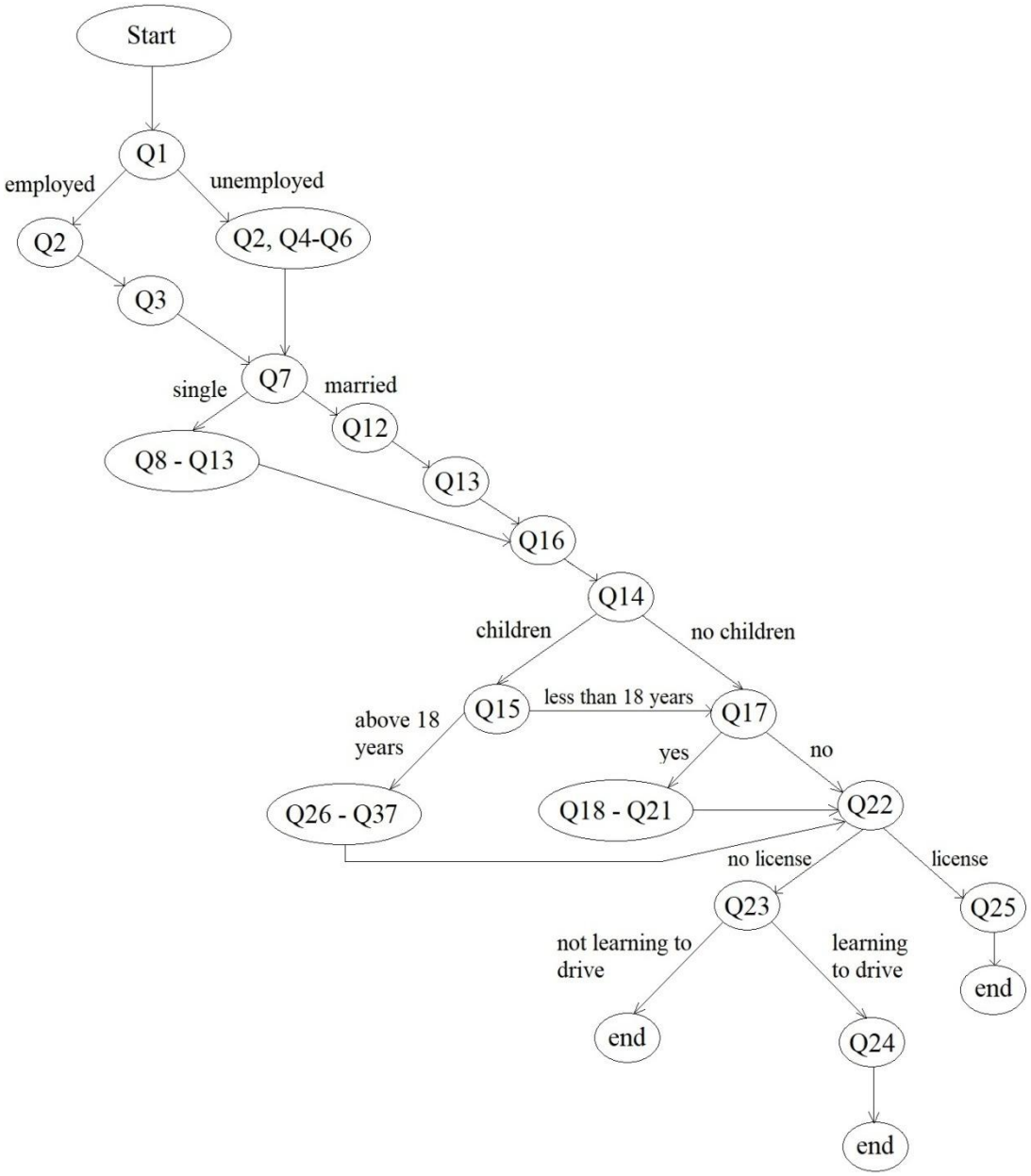

Fig 3: Block diagram of question dynamics

The question dynamics has been organised in such a manner that appropriate questions are asked to people belonging to different situations. For example, if a person is married then we should not ask whether he has planned to purchase automobiles on the eve of his marriage. Similarly, if a person doesn't have children, then there is no point in asking whether he/she wants to buy private vehicles during their marriage, course completion, acquiring of driving licence etc. These questions are actually more applicable for those who have children aged above 18 years. Therefore, Q26 to Q37 are relevant for the above 18 years' branch generating from question 15 which inquires whether the children are above 18 years or not. Likewise, it may be seen that if a person is unemployed, it makes no meaning to ask whether just after retirement, he or she wants to buy a vehicle. So, Q3 is not a part of the unemployed branch that generates from Q1, it is only part of the employed branch generating from Q1 and going to Q7 through Q2 and Q3. Q7 asks about the relationship status which is not dependent upon employment status of a person. Q12 and Q13 ask about the relocation status which is important both for single and married, employed an unemployed. So, Q12 and Q13 appeared in both branches. Q18 to Q21 are associated to own course completion on educational advancement which are not very common or practical for aged parents whose children are 18 years or higher. Hence, these questions are not included in "above 18 years"' branch generating from Q15. However, acquiring a diving licence may still be possible when children are above 18 years. Hence, there is a linkage from Q36 to Q22. Q25 is asked if a person has driving licence. But if he doesn't have, then Q23 is asked which enquires about whether a person is currently learning driving or not.

Formulation of antecedents of API mentioned above appears in Table 2.

Table 2: name of antecedents and their mathematical formulation

Antecedent	Mathematical Formula
Promotion	Q2+Q35 $\overline{Q36}$
Marriage	Q8+Q10 Q11+Q27 $\overline{Q28}$
New Job	Q2+Q4+Q5 Q6+Q29 $\overline{Q30}$
Relocation	Q12+Q31 $\overline{Q30}$
Child birth	Q16+Q37 $\overline{Q36}$
Advancement in education	Q19+Q20+Q21+Q26 $\overline{Q36}$
Acquiring a driving license	Q23 Q24+ Q33 Q34 $\overline{Q36}$
Retirement	Q3

An employed person gets a vehicle after promotion provided he/she buys it ownself Q2 = 1 or his/her parent buy it for them Q35 = 1 and they don't think this purchase is a wastage of money Q36 = 0.

Therefore promotion = Q2 + Q35 $\overline{Q36}$.

(1)

A person may purchase a vehicle on the eve of marriage provided

they buy it for marriage of their children, or

buy it themselves on the eve of their own marriage, or

get as a gift on the eve of their own marriage.

Q27 = 1 if a person wants to buy automobiles on the eve of marriage of a child and at the same time, he should not feel it to be unnecessary (Q28 = 0). Similarly, if a person expects to get an automobile as a gift from parents, friends, in-laws or would be spouse it is a full stop then Q10 = 0. But as the same time there should be ideally no ambiguity in mind of that person regarding exactly who promised it and when (Q11 = 1) because otherwise it becomes a hypothetical and simple talk that has no relevance in context of purchase of a real automobile on the eve of marriage. This gives rise to the formulation of marriage in (2). Another possibility is that he buys it for himself (Q8 = 1).

Therefore, marriage = Q8+ Q10 Q11+ Q27 $\overline{Q28}$

(2)

Regarding purchase of automobiles during new job, API will be 1 if

person intends to buy automobiles as luxury purchase provided that there is a hike in the income (Q2=1)

person wants to buy the same after getting a new job (Q4 = 1)

a) expects to get one from parents or guardians after getting the first job(Q5 = 1)

b) the person explicitly remembers who promised so and when. Because if he is unsure

then it is an irrelevant hypothetical talk that has no real significance to purchase of

API.(Q6 =1)

iii) a) intends to give gift to an youngster in the family for getting a new job (Q29 = 1)

and

b) it doesn't find the purchase behaviour as an unnecessary pampering one(Q30 = 0)

Hence, new job = Q2 +Q4 + Q5 Q 6 + Q29 $\overline{Q30}$

(3)

As far as relocation is concerned,

a person may decide to buy an automobile himself/herself (Q 12 = 1)

a senior person might want to do the same (Q31 = 0), and be the purchase doesn't interfere with his old age insecurity.

So, relocation = Q 12 + Q 31 $\overline{Q36}$

(4)

On events like advancement in education, an automobile may be purchased, because

he/she wants to buy that for own self (Q19 =1)

a) parents expressed the willingness to buy one for facilitation of every day's journey to

the institution (Q20 = 1), or,

b) the parents wanted to give to the same after successful completion of the course (Q21

= 1), or,

c) parents wanted to give to the same after successful completion of the course (Q21= 1)

iii) a) he/she wants to gift to any youngster in the family to encourage him slash herd in

studies (Q26=1)

b) at the same time the purchase should not be felt as a wastage of money (Q36 = 0),

Otherwise it may become difficult later to convert it to a real purchase

Advancement In Education = Q19 + Q21 + Q21 + Q26 $\overline{Q36}$ (5)

A driving licence may be acquired provided

a person is presently learning to drive (Q23=1), or

he/she has plans to buy an automobile after getting a driving licence (Q24 = 1), or

a) some youngster in the family is currently learning to drive (Q33 = 1)

b) the person wants to buy an automobile for him (Q34 = 1)

c) he doesn't find it an wasteful purchase (Q36 = 0)

So, acquiring a driving licence = Q23 Q 24 + Q 33 Q34$\overline{Q36}$ (6)

A person may purchase a vehicle during childbirth if

he/she thinks it is the best mode of transportation for small babies (Q16=1) or,

a) he/she wants to buy it for a small baby in the family (Q37=1)

and

b) the purchase should not be seen wasteful to the person (Q36=0)

So, childbirth = Q16 + Q37 $\overline{Q36}$ (7)

Retirement involves only one question, i. e. Q3

So, retirement = Q3 (8)

4.3 Results of Focus Group

We have obtained responses from 60 focus groups, The key events that have been mentioned are marriage, acquiring a driving license, newjob, promotion, birth of a child and relocation.

5. Cluster and Correlation Analysis with Hypothesis Formulation

5.1 Cluster Analysis

In this phase, the opinions of focus group participants are clustered. First of all, elbow method is applied to identify optimal number (*) of clusters and after that we perform K-means clustering specifying those many number of clusters (k) as desirable. In our case, output k of elbow method is shown in fig 4.

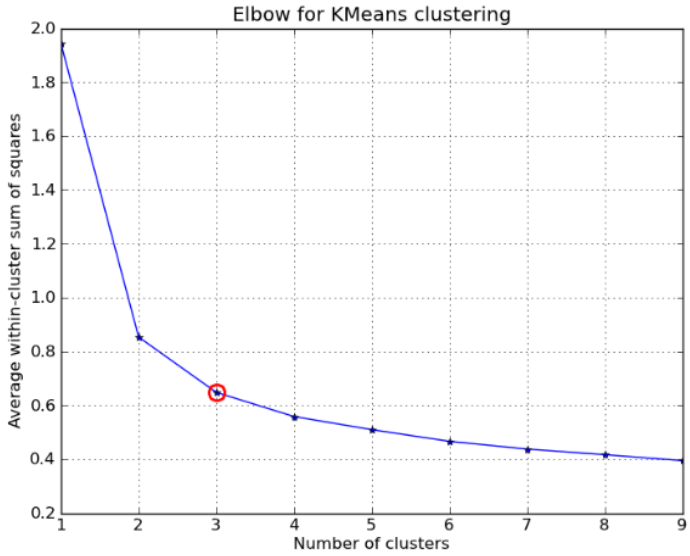

Fig 4: Finding optimum number of clusters using the elbow method

All the focus group responses are associated to cluster ids 1,2, or 3 as output of K-means Clustering. Along with that, we also get centers of all the clusters as generalized sub-group responses. In this case, cluster-1 corresponds to the age group 18-28; cluster-2 and cluster-3 are associated to age groups 54-76 and 29-53 respectively. As per final cluster centers of each cluster, table 3 represents the set of key life events or occasions along with total number of cases in each cluster. Table 4 demonstrates accuracy index a(cid) of a cluster with identification number cid (cid= 1,2 or 3) as mathematically expressed in (9).

$$a(cid) = \frac{nodev-rec(cid)}{tot-rec(cid)} \quad (9)$$

Where tot-rec (cid) is total number of records in cluster cid and nodev-rec(cid) is the number of records that do not deviate from center of its own cluster, that is, do not deviate from general behavior of its group.

Table 3: Demonstration of Clusters

Cluster id	Age group	Important Life events	Total no of records
1	18-28	Marriage, Promotion, Relocation	189
2	54-76	Marriage, Promotion, Newjob, Relocation, Birth of a child	262
3	28-53	Newjob, Promotion, Birth of a Child	159

Table 4: Deviated and Non-deviated Records

Present Cluster -> Appropriate cluster as per age group	1	2	3
1	157	4	10
2	24	253	24
3	8	5	125

Table 4 shows that among189 records in cluster 124 records are there which are in cluster 1 but should have been in cluster 2 and 8 records are in cluster 1,but should belong to cluster 3.

So, number of non deviated records in Cluster 1 is a(1) as shown below:

$$a(1) = \frac{189-(24+8)}{189} = \frac{157}{189} = 0.8307 \ (2)$$

Expressed in percentage a(1) is 83.07% which is higher than 75%. So, consensus is built in cluster 1.

Similarly in cluster 2, total 262 entries are there and among those, 4 entries are in cluster 2 which should have been in cluster 1 as per age group and 5 entries are there in cluster 2 which should have been cluster 3., So, number of non deviated records in Cluster 2 is a(2) as shown below:

$$\text{So, } a(2) = \frac{262-(4+5)}{262} = \frac{253}{262} = 0.9656 \ (3)$$

Expressed in percentage, a(2) is 96.56% which is higher than 75% so, consensus is build is cluster 2 too.

Similarly in cluster 3, total 159 entries are there and among those, 10 entries should have been in cluster 1 and 24 entries in cluster 2. Hence, number of non deviated records in Cluster 3 is a(3) as shown below:

$$\text{So, } a(3) = \frac{159-(24+10)}{159} = \frac{125}{159} = 0.7862 \ (4)$$

Expressed in percentage, it is 78.62% which is higher than 75%.

Therefore, consensus is built in cluster 3 as well.

5.2 Analysis of focus group responses

Table 5 shows final cluster centers whereas correlation values of the important events are presented in table 6. It is evident from table 5 that evident like advancement-in-education, acquiring-a-driving-license and retirement have not come up as an important influencer for determining automobile purchase intention of Indian customers of age groups between 18 and 76. Hence we have eliminated these events in subsequent analysis. Therefore, table 6 illustrates correlation between marriage, newjob, promotion, relocation and birth of a child. Here it is seen that birth of a child and promotion are having correlation higher than 0.6, indicating that these two are highly correlated. Hence, in subsequent analysis, without any loss of generality, we proceed with the event promotion and eliminate birth of a child as shown in table 7. Other events have correlation less than 0.6. Each correlation is associated with either ** or *. ** means that the correlation value is significant with $p < 0.01$ and * means that the correlation value is significant with $p < 0.05$. The correlation between promotion and birth of a child may be explained based on psychology of caring parents. If a person buys a private vehicle after being rewarded with promotion, then his/her intentions are two-fold – i) rising in social status and upgrading to a more comfortable lifestyle. The first one is supported by Social Cognitive Theory while the later is as per Mashlow's Hierarchy of Needs (Shende (2014), Yan et al. (2022)). Participants in focus groups mentioned it many times that lifestyle and social image of a person are largely coupled with the same of his immediate family which includes spouse and children. There are literally evidences in support of this statement (Enell, Wilinska (2021)). In order to protect the family from pollution, extreme weather and discomfort of public transit systems, it is natural for economically well-established people to get inclined to private vehicles on events of childbirth (Vasudevan et al. (2021)).

It is evident from table 5 that advancement in education and retirement could not show up as substantial influencers of API for Indian customers. Reasons that have been mentioned by some group participants are, additional expenditure incurred due to ongoing courses and problems related to retirement, like coping up with comparably less or no regular income, lack of mobility etc. These perceptions reduce the utility of conspicuous consumption in their own lives. Still they wanted to gift luxurious cars, bikes etc. during marriage, child birth and housewarming occasions of children and grandchildren. Especially marriage was highlighted. Participants opined that if they buy a private vehicle during these events, it will add value to the family relations; it will strengthen bonding between generations. Also it is expected to be unique among other luxurious items like jewelries, electronic gadgets etc. Therefore, marriage, childbirth and relocation are considered more impactful to determine API compared to retirement, advancement in education and acquiring a driving license. Rather, people argued in the focus group that a person, who doesn't want to be a driver by profession, first makes up his/ her mind to purchase a vehicle and then starts to learn driving. Here, the intention to purchase a vehicle has been proposed as an antecedent of acquiring a driving license and not the other way round.

Table 5: Final Cluster Centers

	Cluster		
	1	2	3
Advancement in education	0	0	0
Marriage	1	1	1
Newjob	0	1	0
Promotion	1	1	1
Birth of a child	0	1	1
Relocation	1	1	0
Acquiring a driving license	0	0	0
Retirement	0	0	0

Table 6: Correlation among different key events of life

	Marriage	Newjob	promotion	birthofachild	relocation
Marriage	1 610	-.083* .041 610	.113** .005 610	.057 .163 610	.024 .554 610
Newjob	-.083* .041 610	1 610	.248** .000 610	.418** .000 610	.213** .000 610
promotion	.113** .005 610	.248** .000 610	1 610	.652** .000 610	.120** .003 610
birthofachild	.057 .163 610	.418** .000 610	.652** .000 610	1 610	.024 .547 610
relocation	.024 .554 610	.213** .000 610	.120** .003 610	.024 .547 610	1 610

Table 7: Antecedents for different age groups

Cluster	**Age Group**	**Reduced set of important occasions**
1	18-28	Marriage, Promotion, Relocation
2	53-76	Marriage, Promotion, Newjob, Relocation
3	28-53	Relocation, Promotion

5.3 Formulation of Hypothesis

The series of hypothesis for various age groups appear in table 8. To test these, we prepare a questionnaire for each group and distribute among relevant members to collect responses.

Table 8: statement of each hypothesis for each group

Age group	**Hypothesis identification number**	**Hypothesis statement**
18-28	H1	Marriage as a key life event influences purchase intention of customers

	H2	Promotion as a key life event influences purchase intention of customers
	H3	Relocation as a key life event influences purchase intention of customers
29-53	H4	Relocation as a key life event influences purchase intention of customers
	H5	Promotion as a key life event influences purchase intention of customers
54-76	H6	Marriage as a key life event influences purchase intention of customers
	H7	Promotion as a key life event influences purchase intention of customers
	H8	Relocation as a key life event influences purchase intention of customers
	H9	Newjob as a key life event influences purchase intention of customers

6. Structural Equation Models

6.1 Design of Questionnaire For Reduced set of Event

Overall set of reduced life events is {Marriage, Newjob, Relocation,Promotion}. Hence, overall questionnaire consists of 5 parts – one each for Marriage(m), Relocation (r), Promotion(P), Newjob(n) and Purchase Intention (pi). M is measured using four questions m1, m2, m3 and m4. R is measured with r1, r2, r3. P is measured with p1, p2,p3. For newjob, the sub-constructs are n1,n2,n3. Components of purchase intention are pi1,pi2 and pi3. The set of constructs applicable for cluster 1 is {m1, m2, m3, m4, p1, p2, p3, r1, r2, r3, pi1, pi2, pi3}. The same for cluster 2 is {m1, m2, m3, m4, p1, p2, p3, r1, r2, r3, pi1, pi2, pi3, j1, j2, j3}. Similarly the set of clusters for cluster 3 are {m1, m2, m3, m4, p1, p2, p3, pi1, pi2, pi3}. Table 9 details about significance of all these constructs.

Table 9: Implications of constructs

construct	significance
m1	Preference of purchasing automobiles during marriage.
m2	Past incidents of getting automobile products in marriages
m3	Past incidents of purchasing automobile products for oneself in marriage
m4	Family of practice of purchasing automobiles during marriage
r1	Preference of purchasing automobiles after shifting house to a new location
r2	Perception of convenience in private transportation after moving to a new house

r3	Perception of convenience in public transportation after moving to a new house
j1	Preference of purchasing car, bikes etc. after getting a new job
j2	Social pressure to buy a new private vehicle after getting a new promotion
j3	Precedence of such social pressure driven purchase of personal vehicle after getting a new job
p1	Preference of purchasing private vehicles after getting a new promotion
p2	Social pressure to buy a new private vehicle after getting a new promotion
p3	Precedence of such social pressure driven purchase of a personal vehicle after getting a new promotion
pi1	Attitude to travel by a private vehicle
pi2	Perception of convenience in travelling by a private vehicle compared to private transport
pi3	Incidents of recommending private vehicles to others

6.2 Measurement models for different groups

Measurement models of different groups are illustrated here along with associated demographical information using R software version 4.0.2 especially the lavaan package.

6.2.1 Measurement Model for the age group 18-28

6.2.1.1 Description of the model

The questionnaire for this group was sent to 659 participants among with 512 complete responses have been obtained. Table 10 shows demography of the participants whereas descriptive statistics of the constructs appear in table 11. Convenience sampling method is used to select samples because except age, there was no other specific criterion or purpose to be taken care of, during the collection. Corresponding questions were m1, m2, m3, m4, p1, p2, p3, r1, r2, r3, pi1, pi2 and pi3.

Correlation matrix is shown in table 12.

Table 10: Demographics of the respondents

Variable	Categories	Statistics
Gender	Male	316
	Female	195
Educational level	School level	47
	Bachelors degree	282
	Master's degree	183
Income	Minimum	<50,000 / month
	Maximum	2,00,000 / month

All responses are measured on a 5 point Likert's scale, that is, values are between 1 and 5.

Table 11: Descriptive statistics of the constructs

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
r1	511	1.00	5.00	3.6908	1.03767
r2	511	1.00	5.00	3.7847	1.07222
r3	511	1.00	5.00	3.6027	1.17687
m1	511	1.00	5.00	3.7476	1.03321
m2	511	1.00	5.00	3.7280	1.04899
m3	511	1.00	5.00	3.9119	1.04697
m4	511	1.00	5.00	3.7769	1.01031
pi1	511	1.00	5.00	3.6282	.99937
pi2	511	1.00	5.00	3.3581	1.14572
pi3	511	1.00	5.00	3.5597	1.05527
p1	511	1.00	5.00	3.7339	1.10063
p2	511	1.00	5.00	3.5910	1.13545
p3	511	1.00	5.00	3.5499	1.14145
Valid N (listwise)	511				

	r1	r2	r3	m1	m2	m3	m4	pi1	pi2	pi3	p1	p2	p3
r1	1	.479**	.540**	.278**	.216**	.433**	.299**	.498**	.313**	.413**	.218**	.297**	.329**
		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	511	511	511	511	511	511	511	511	511	511	511	511	511
r2	.479**	1	.501**	.291**	.297**	.418**	.341**	.342**	.310**	.368**	.285**	.280**	.280**
	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	511	511	511	511	511	511	511	511	511	511	511	511	511
r3	.540**	.501**	1	.261**	.324**	.395**	.347**	.288**	.287**	.350**	.254**	.358**	.319**
	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	511	511	511	511	511	511	511	511	511	511	511	511	511
m1	.278**	.291**	.261**	1	.577**	.585**	.662**	.245**	.431**	.349**	.258**	.236**	.289**
	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	511	511	511	511	511	511	511	511	511	511	511	511	511
m2	.216**	.297**	.324**	.577**	1	.537**	.553**	.298**	.450**	.327**	.253**	.227**	.274**
	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	511	511	511	511	511	511	511	511	511	511	511	511	511
m3	.433**	.418**	.395**	.585**	.537**	1	.530**	.353**	.427**	.503**	.288**	.252**	.264**
	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
	511	511	511	511	511	511	511	511	511	511	511	511	511
m4	.299**	.341**	.347**	.662**	.553**	.530**	1	.326**	.504**	.421**	.537**	.448**	.261**
	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000
	511	511	511	511	511	511	511	511	511	511	511	511	511
pi1	.498**	.342**	.288**	.245**	.298**	.353**	.326**	1	.514**	.575**	.159**	.255**	.317**

	.000 511	.000 511	.000 511	.000 511	.000 511	.000 511	.000 511	 511	.000 511	.000 511	.000 511	.000 511	.000 511
pi2	.313** .000 511	.310** .000 511	.287** .000 511	.431** .000 511	.450** .000 511	.427** .000 511	.504** .000 511	.514** .000 511	1 511	.598** .000 511	.237** .000 511	.319** .000 511	.291** .000 511
pi3	.413** .000 511	.368** .000 511	.350** .000 511	.349** .000 511	.327** .000 511	.503** .000 511	.421** .000 511	.575** .000 511	.598** .000 511	1 511	.269** .000 511	.290** .000 511	.281** .000 511
p1	.218** .000 511	.285** .000 511	.254** .000 511	.258** .000 511	.253** .000 511	.288** .000 511	.537** .000 511	.159** .000 511	.237** .000 511	.269** .000 511	1 511	.503** .000 511	.388** .000 511
p2	.297** .000 511	.280** .000 511	.358** .000 511	.236** .000 511	.227** .000 511	.252** .000 511	.448** .000 511	.255** .000 511	.319** .000 511	.290** .000 511	.503** .000 511	1 511	.467** .000 511
p3	.329** .000 511	.280** .000 511	.319** .000 511	.289** .000 511	.274** .000 511	.264** .000 511	.261** .000 511	.317** .000 511	.291** .000 511	.281** .000 511	.388** .000 511	.467** .000 511	1 511

Table 12: Correlation matrix of the constructs

From table 12 it may be seen that all correlations are lesser than 0.6 except the correlation between m4 and m1. Among these two we have eliminated m4. Cronbach alpha statistics of the data is 0.880. after elimination of m4, percentage of information represented by remaining attributes become 67.023, whereas after eliminating m1, percentage of information becomes 63.215. The set of attributes denotes adequate sampling adequacy according to Kaiser- Meyer-Olkin measure because the associated value 0.832 lies in meritorious range, that is, 0.8 – 0.9. Sig value in Barlelt's test of sphericity is 0.000 which denotes rejections of null hypothesis, that is, the variables are uncorrelated and dimensionality of the data cannot be reduced further. The data is really a random sample from a multivariate normal variation. Measurement items and their reliability appear in table 13. Names of the attribute or table columns are main latent variable, item of construct, Cronbach alpha (α), factor loading, average variance explanation (AVE) and composite reliability (CR). Here pi is the dependent variable whereas m,p and r are independent variables. Moreover the sample consists of more than 500 survey responses which we consider to be significant because many authors have advocated for at least 200 responses (Shukla, 2010), Wu. et al. (2011)).

Table 13: Measurement items and reliability

Main latent variable	Item of the construct	Factor loading	AVE	CR
m	m1	0.74	0.5639	0.7946
	m2	0.71		
	m3	0.80		
p	p1	0.64	0.456	0.7141
	p2	0.74		
	p3	0.64		
r	r1	0.73	0.505	0.7532
	r2	0.68		
	r3	0.72		
pi	pi-1	0.70	0.569	0.7981
	pi-2	0.75		
	pi-3	0.81		

The proposed structural model included a test of overall model fit and individual test of significance of linkage between the variables. Here pi is dependents variable and m, p and r are independent variables. Maximum likelihood method is used to estimate model parameters. In table 17, average variance explained is higher than 0.5 for all four of m, p, r and pi. Only for p it is 0.456 which, if approximated upto one digit after the decimal point then it will also become 0.5, that is, in the acceptable range. Minimum composite reliability on R is 0.7141. therefore all values of CR are in acceptable range and convergent validity is established. (Keller(1998)). Values of cfi, rmsea, srmr, gfi,agfi and tli are 0.934, 0.078, 0.044, 0.938, 0.900 and 0.909 all of which are acceptable. Among r, p and m, m has highest impact on pi (0.418). r also does not lag much behind (0.317). p has the smallest impact on pi (0.128), therefore marriage and relocation have higher impact on automobile purchase intention compared to promotion.

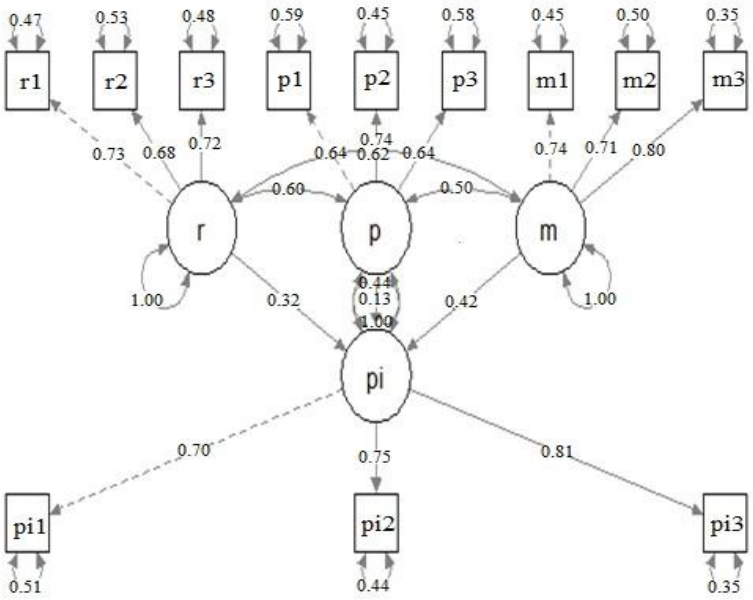

Fig 5: Structural equation model for the age group 18-28

6

.2.1.2 Discussion of The Result

Discovered antecedents of this group are marriage, promotion and relocation. Only a few participants between 24 and 28 years explicitly expressed the desire to purchase a vehicle on the eve of marriage, on their own. Along with substantial increase in salary, the also mentioned low interest rate and easy availability of car loan as bank policies that encourage purchase intention of automobiles. The underlying psychological characteristic of perseverance and pride about economic independence was quite prevalent in their attitude and responses. On the other hand, many respondents between 18 and 23 years revealed their expectation about getting a private transport as gift in marriage, especially from parents and in-laws. In India marriages are celebrated with great pomp and grandeur and there is a social custom by which in-laws of the groom offer luxurious and premium gift to him as a gratifying and prestigious welcome gesture. Customs like this often generate expectation in the mind of people (Anderson (2003), Devika, Praveena(2001), although laws have been framed against it to relieve the bride's family from unjustifiable pressure and extortion of in-laws to mandatorily give all the desired gifts (Malik and Malik (2022)). Overall if we analyze focus group responses of the age groups 18-28 years, there is, in general, an emphasis on the event of marriage as an antecedent of API.

Regarding promotion, responses of participants are more on less uniform. The psychological need to exhibit social distinction and higher economic status, along with the physiological need to improve lifestyle of the family, have been mentioned as encouraging factors to buy a car or bike, especially when the cost-to-company reaches a substantial height.

Relocation means shifting the house from one core area to another. In the cases where relocation comes with promotion, the need for safety and security piles up along with the psychological and physiological needs mentioned above. In general the criterion of safety is emphasized even more provided that participant's relationship status is married with one or two children. The facility of global poisoning system and Bluetooth enable spontaneous traveling in the new area without much dependence on the local people. Hence it acts as an API.

6.2.2 Measurement Model for the age group 29-53

6.2.2.1. Description of The Model

The questionnaire was sent to 733 participants among which 654 complete responses were received. Demographics of participants appear in table 14 while descriptives appear in table 15. Here also convenience sampling has been applied and relevant questions are r1, r2, r3, p1, p2, p3, pi1, pi2 and pi3. Correlation matrices appear in table 16

Table 14. Demographics of responders

Variable	Categories	Statistics
Gender	Male	411
	Female	243
Educational level	School level	78
	Bachelors degree	304
	Master's degree	272
Income	Minimum	1,00,000 / month
	Maximum	7,00,000 / month

Here also, all response values are between 1 and 5. Value of cronbach alpha is 0.854 whereas result of KMO and Barletts test is 0.885, with sig value being 0.000. so, the test is significant with respect to given data.

Table 15: Descriptive statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
pi1	653	.00	5.00	4.2297	.95573
pi2	653	.00	5.00	4.5161	.86787
pi3	653	.00	5.00	4.3599	.88480
r1	653	.00	5.00	4.4135	.86900
r2	653	.00	5.00	4.3338	.89582
r3	653	.00	5.00	4.0858	.92941
p1	653	.00	5.00	4.3415	.81666
p2	653	.00	5.00	4.1884	.91329
p3	653	.00	5.00	4.3874	1.02198
Valid N (listwise)	653				

	pi1	pi2	pi3	r1	r2	r3	p1	p2	p3
pi1	1 653	.500** .000 653	.492** .000 653	.445** .000 653	.344** .000 653	.340** .000 653	.316** .000 653	.242** .000 653	.290** .000 653
pi2	.500** .000 653	1 653	.597** .000 653	.538** .000 653	.463** .000 653	.360** .000 653	.314** .000 653	.307** .000 653	.328** .000 653
pi3	.492** .000 653	.597** .000 653	1 653	.554** .000 653	.435** .000 653	.380** .000 653	.379** .000 653	.330** .000 653	.288** .000 653
r1	.445** .000 653	.538** .000 653	.554** .000 653	1 653	.382** .000 653	.404** .000 653	.354** .000 653	.302** .000 653	.284** .000 653
r2	.344** .000 653	.463** .000 653	.435** .000 653	.382** .000 653	1 653	.454** .000 653	.299** .000 653	.234** .000 653	.271** .000 653
r3	.340** .000 653	.360** .000 653	.380** .000 653	.404** .000 653	.454** .000 653	1 653	.295** .000 653	.250** .000 653	.277** .000 653
p1	.316** .000 653	.314** .000 653	.379** .000 653	.354** .000 653	.299** .000 653	.295** .000 653	1 653	.430** .000 653	.444** .000 653
p2	.242** .000 653	.307** .000 653	.330** .000 653	.302** .000 653	.234** .000 653	.250** .000 653	.430** .000 653	1 653	.471** .000 653
p3	.290** .000 653	.328** .000 653	.288** .000 653	.284** .000 653	.271** .000 653	.277** .000 653	.444** .000 653	.471** .000 653	1 653

Table 16: Correlation matrix of antecedents

Table 17:Measurement items and reliability

Main latent variable	Item of the construct	Factor loading	AVE	CR
r	r1	0.66	0.5204	0.762
	r2	0.74		
	r3	0.76		
p	p1	0.68	0.4789	0.708
	p2	0.66		
	p3	0.67		
pi	pi1	0.75	0.5631	0.7994
	pi2	0.78		
	pi3	0.72		

As evident from table 17, values of AVE of both r and pi are higher than 0.5 whereas the same for p is 0.4785, which, if we approximate, will become 0.5. This justifies our claim of convergent validity. Values of composite reliability of CR are all higher than 0.7 which means that the values are acceptable. The structural equation model appears in fig 5. The impact of r on pi is 0.55 which is higher than the same of p on pi, which is 0.34. So, relocation has higher impact on pi. The structural equation model appears in fig 6.

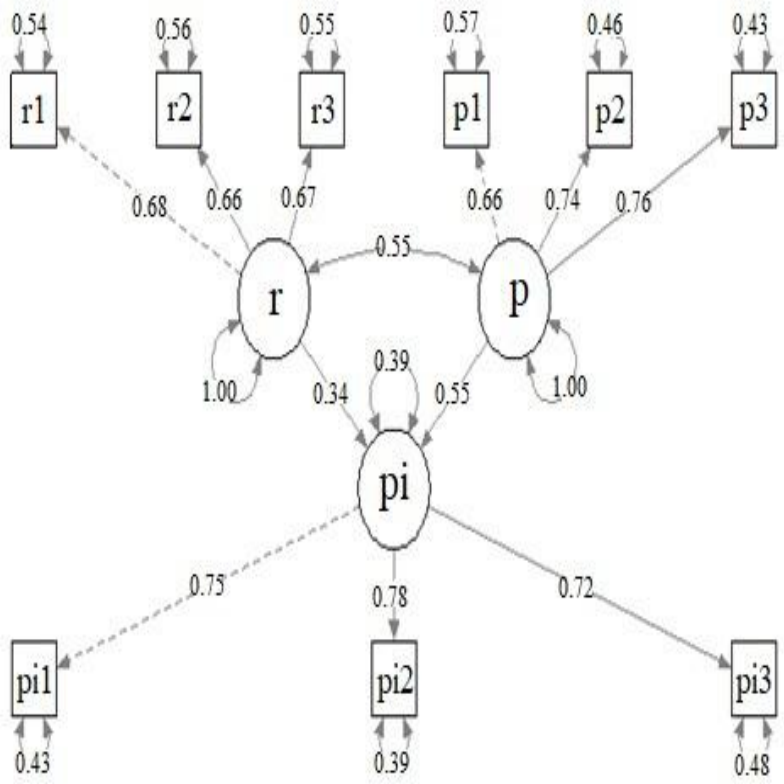

Fig 6: Structural equation model of the age group 29-53

6.2.2.2. Discussion of the Result

Most of the people in this age are already married and many of them have children. The parents have to plan future of their wards which includes setting money aside and investing in profitable policies and options for their education, marriage etc. Relocation at this age is mainly due to promotion and other job related reasons. Among these only promotion increase average weighted monthly income of the family and enable purchases of automobile products. Moreover safety and security related needs are always there irrespective of age. Therefore relocation and promotion have been highlighted as event-antecedents of API for customers between 29 and 53. As far as new job is concerned, it could not come up as an antecedent of API for this group. Reason is that there exists a difference between new job and promotion although both of these increase weighted family income of a household. New job is all about joining in a new company, adjusting in a new environment with new people around which involves a sense of insecurity that may reduce the attitude of consumption of a person and increase the inclination towards saving. Therefore API of A person in this age group does not necessarily increase with getting a new job.

6.2.3 Measurement Model for the age group 54-76

6.2.3.1 Description of the Model

The questionnaire was sent to 1000 people and among then 755 complete responses were received Demographics of these participants appear in table 18

Table 18: Demographics of survey participants

Variable	Categories	Statistics
Gender	Male	402
	Female	353
Educational level	School level	102
	Bachelors degree	416
	Master's degree	237
Income	Minimum	1,00,000 / month
	Maximum	15,00,000 / month

All response values are between 1 and 5. Cronbach α for this entire data set is 0.890 whereas result of KMO and Barlett's test yields 0.892 with sig value being 0.000. So, the test is significant with respect to given data. Descriptive statistics appear in table 19 whereas table 20 shows correlation analysis. Table 21 illustrates measurement items of various constructs. All correlation values are less than 0-6 except the one between m3 and p2. So, we eliminated m3 because three more remaining constructs are there. This ensures divergent validity whereas convergent validity is ensured by values of AVE (average variance explained) and CR (composite reliability).

Table 19: Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
m1	754	1.00	5.00	3.6684	1.12151
m2	754	1.00	5.00	3.6684	1.13329
m3	754	1.00	5.00	3.5836	1.21590
m4	754	1.00	5.00	3.7003	1.12809
r1	754	1.00	5.00	3.7281	1.10008
r2	754	1.00	5.00	3.6883	1.12071
r3	754	1.00	5.00	3.6645	1.14437
p1	754	1.00	5.00	3.6432	1.12619
p2	754	1.00	5.00	3.3793	1.26843
p3	754	1.00	5.00	3.5544	1.13162
pi1	754	1.00	5.00	3.6260	1.13529
pi2	754	1.00	5.00	3.6950	1.11838
pi3	754	1.00	5.00	3.5915	1.16966
j1	754	1.00	5.00	3.6578	1.21288
j2	754	1.00	5.00	3.5902	1.20775
j3	754	1.00	5.00	3.5716	1.23722
Valid N (listwise)	754				

	m1	m2	m3	m4	r1	r2	r3	p1	p2	p3	pi1	pi2	pi3	j1	j2	j3
m1	1	.540**	.499**	.262**	.392**	.270**	.395**	.295**	.297**	.304**	.507**	.386**	.374**	.249**	.319**	.368**
		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
m2	.540**	1	.430**	.310**	.306**	.371**	.365**	.287**	.308**	.295**	.345**	.426**	.269**	.266**	.306**	.357**
	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
m3	.499**	.430**	1	.367**	.436**	.415**	.485**	.319**	.369**	.347**	.281**	.346**	.303**	.251**	.340**	.377**
	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
m4	.262**	.310**	.367**	1	.543**	.836**	.456**	.277**	.321**	.324**	.226**	.358**	.256**	.223**	.231**	.322**
	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
r1	.392**	.306**	.436**	.543**	1	.590**	.551**	.264**	.329**	.342**	.390**	.359**	.331**	.254**	.294**	.376**
	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
r2	.270**	.371**	.415**	.836**	.590**	1	.523**	.327**	.363**	.356**	.231**	.407**	.302**	.259**	.253**	.365**
	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
r3	.395**	.365**	.485**	.456**	.551**	.523**	1	.315**	.451**	.400**	.345**	.366**	.377**	.258**	.291**	.380**
	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
p1	.295**	.287**	.319**	.277**	.264**	.327**	.315**	1	.562**	.515**	.243**	.332**	.175**	.208**	.259**	.351**
	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
p2	.297**	.308**	.369**	.321**	.329**	.363**	.451**	.562**	1	.564**	.282**	.354**	.293**	.224**	.285**	.344**
	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
p3	.304**	.295**	.347**	.324**	.342**	.356**	.400**	.515**	.564**	1	.317**	.377**	.332**	.378**	.375**	.441**
	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000

	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
pi1	.507**	.345**	.281**	.226**	.390**	.231**	.345**	.243**	.282**	.317**	1	.571**	.532**	.172**	.270**	.309**
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
pi2	.386**	.426**	.346**	.358**	.359**	.407**	.366**	.332**	.354**	.377**	.571**	1	.549**	.223**	.361**	.467**
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
pi3	.374**	.269**	.303**	.256**	.331**	.302**	.377**	.175**	.293**	.332**	.532**	.549**	1	.160**	.230**	.359**
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
j1	.249**	.266**	.251**	.223**	.254**	.259**	.258**	.208**	.224**	.378**	.172**	.223**	.160**	1	.494**	.491**
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
j2	.319**	.306**	.340**	.231**	.294**	.253**	.291**	.259**	.285**	.375**	.270**	.361**	.230**	.494**	1	.547**
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754
j3	.368**	.357**	.377**	.322**	.376**	.365**	.380**	.351**	.344**	.441**	.309**	.467**	.359**	.491**	.547**	1
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754	754

Table 20: correlation analysis

Table 21: Measurement items and reliability

Main latent variable	Item of the construct	Factor loading	AVE	CR
m	m1	0.740	0.498	0.745
	m2	0.679		
	m3	0.686		
P	p1	0.761	0.546	0.782
	p2	0.762		
	p3	0.692		
j	j1	0.622	0.509	0.755
	j2	0.703		

	j3	0.805		
r	r1	0.757	0.554	0.789
	r2	0.729		
	r3	0.748		
pi	pi-1	0.729	0.552	0.774
	pi-2	0.797		
	pi-3	0.696		

In correlation matrix of table 20, none of the values are greater than or equal to 0.6, except the one between m4 and pi3. So, m4 has been eliminated. The resultant matrix therefore ensures divergent validity. On the other hand, convergent validity is ensured in table 21 where all factor loadings associated to several items of the construct are higher than 0.50. AVE or average variance explained, is more than 50% for all four of p, j, r and pi, whereas for m, it is 49.8% which is very close to the ideal. Composite reliability values of m, p, j, r and pi are 0.748, 0.782, 0.755, 0.789 and 0.774, respectively. That is, all the values are higher than 0.7 which is in acceptable range.

The structural equation model includes tests of the overall model fit and individual tests of significance of the linkage among various variables. Here pi is the dependent variable whereas m,p,j and r are independent variables. There are 654 survey responses (more than 500 responses). Which may be considered as significant (Shukla, 2010), Wu et.al, 2011). As far as model fit is concerned values of cfi,rmsea, srmr, gfi,agfi and tli are 0.930, 0.072, 0.042, 0.934, 0.901 and 0.908 respectively. Among these values, rmsea and srmr are in the acceptable range whereas values of other parameters are in meritorious range. As far as impacts of m,p,r and j on pi are concerned, m has highest impact, that is, 0.417, and p or promotion has got least impact that is, 0.117. influences of relocation and newjob are 0.165 and 0.146, quite close to each other. The plot is shown in fig 7.

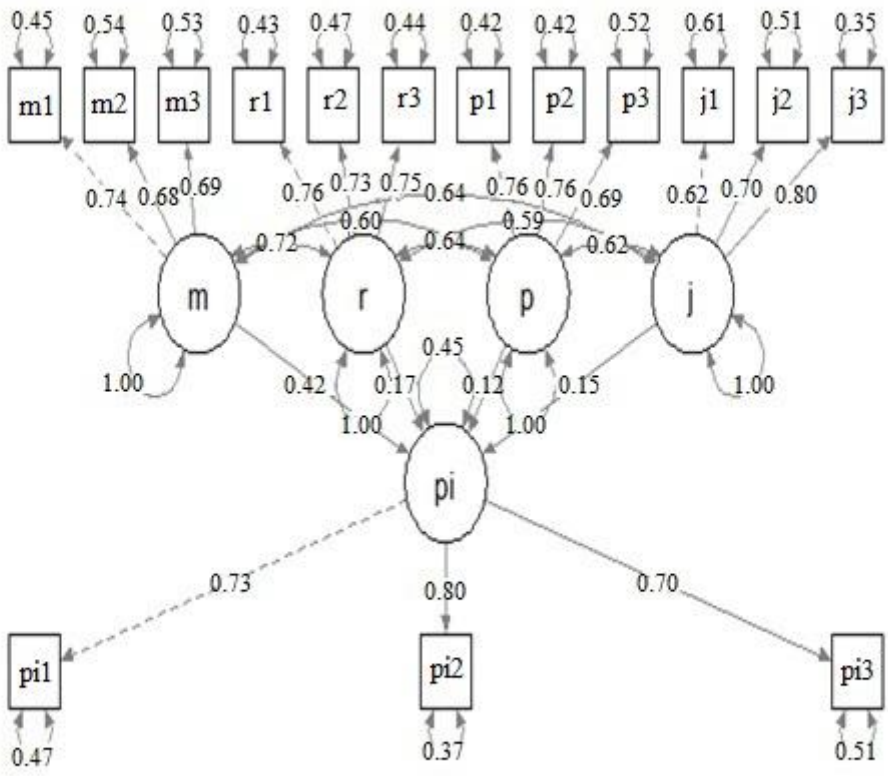

Fig 7: Structural equation model of age group 54-76

6.2.3.2. Discussion of the Result

In this age, people mostly think about carrier and life of their children and grandchildren. They are quite advanced in their own careers and financial blueprint is almost ready. Hence they are in a position to spend money lavishly for youngsters during celebrations of their (i) marriage (ii) shifting of habitat or (iii) getting lucrative job. Also substantial increase in average disposable income in their own career, contribute significantly to their API.

6.2.4 Testing of Hypothesis

Result of testing all these hypotheses appear in table 22.

Table 22: Testing of Hypothesis

Age group	Hypothesis identification number	Hypothesis statement	Sig value	Comment
18-28	H1	Marriage as a key life event influences purchase intention of customers	0.000	Supported with p value < 0.0001
	H2	Promotion as a key life event influences purchase intention of customers	0.045	Supported with p value < 0.05
	H3	Relocation as a key life event influences purchase intention of customers	0.000	Supported with p value < 0.0001
28-53	H4	Relocation as a key life event influences purchase intention of customers	0.000	Supported with p value < 0.0001
	H5	Promotion as a key life event influences purchase intention of customers	0.000	Supported with p value < 0.0001
54-76	H6	Marriage as a key life event influences purchase intention of customers	0.000	Supported with p value < 0.0001
	H7	Promotion as a key life event influences purchase intention of customers	0.043	Supported with p value < 0.05
	H8	Relocation as a key life event influences purchase intention of customers	0.021	Supported with p value < 0.05
	H9	Newjob as a key life event influences purchase intention of customers	0.017	Supported with p value < 0.05

7. Conclusion

Set of all the antecedents considered by the age group 18-76 is consists of marriage, relocation, promotion and newjob. Among these, purchase intention of automobiles' customers is non-negligible for all three of the age groups 18-28, 29-53, 54-76 only in case of relocation and promotion. Marriage is applicable for age groups 18-28 and 54-76, As far as occasional purchase of automobiles

is concerned, the age group 29-53 is most stringent where only relocation and promotion are applicable. Reason is that getting a newjob is very exiting especially when the first job is joined. That is putting the first step on a staircase. Sometimes parents, guardians or senior relatives or acquaintances purchase private vehicles for their wards to encourage them when they get a break. Candidates purchase a vehicle by themselves after getting a good promotion, and not after the first job. Because after getting the first job, youngsters have to adjust to a new environment themselves, learn and grow through experiences. At that time there is tendency to save more. However, during marriage some of them buy a personal vehicle or get it as gift during marriage. Therefore newjob comes as an important antecedent of API for the age group 54-76 where seniors buy the same for children and grandchildren when they get a break.

7.1 Contribution to Theory

The impact of life events on automobile purchase intention of Indian customers can be best explained by Mashlow's Hierarchy of Needs Theory where each layer of need corresponds to one or more events. This gives rise to a new model in Indian context, termed as Event-triggered Model of Hierarchy of Needs for Automobile Purchase EMHN-AP, as shown in fig 8. The lowest layer contains physiological needs where rest is a component which can be provided by comfortable transportation from one location to another; therefore it can promote purchase of automobiles during events like childbirth and relocation. These two events also generate a requirement for safety and security which can be acquired through buying personal vehicles. Above safety needs, there is the layer of belongingness and love which corresponds to the occasion of marriage. In literature review we have mentioned that often automobile products are purchased based on recommendations of spouse, family and friends. Esteem need include the feeling of prestige and accomplishment which are closely related to newjob and promotion. These two events bring about the necessity to rise in social status and a brand new personal vehicle can display wealth like no other. The topmost layer demonstrates the need for self actualization, which, according to our opinion, is not directly associated to any event mentioned here. However, there may be some connection between this layer and advancement in education, or acquiring a driving license, although these two are not significant influencers for potential automobile customers of India.

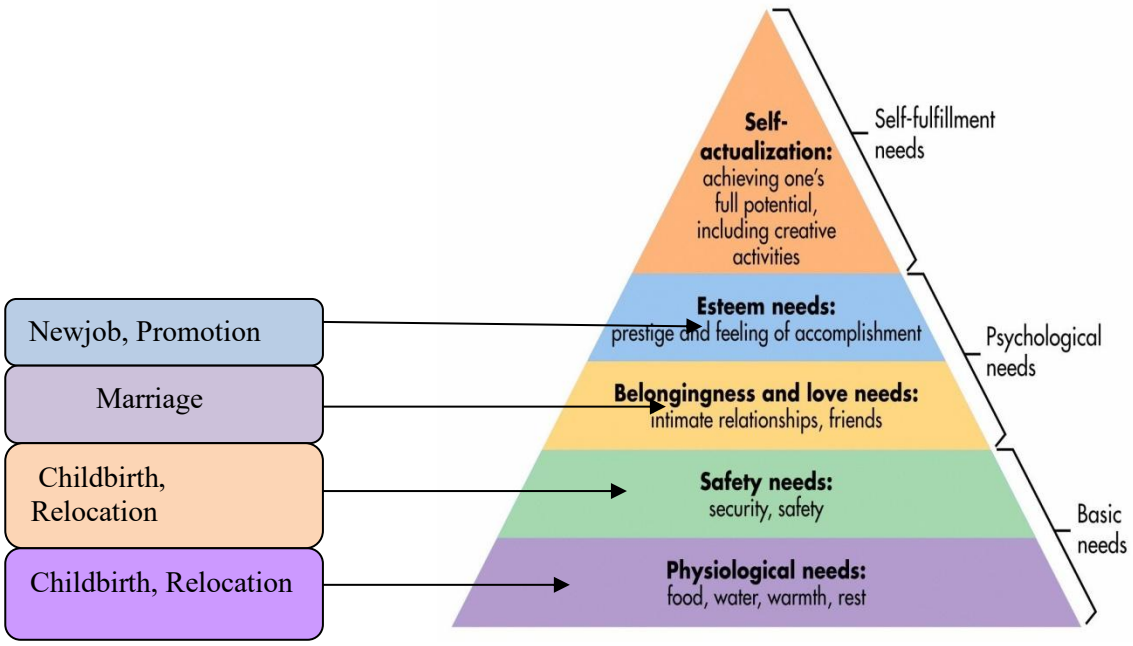

Fig 8: Diagram of EMHN-AP

7.2 Managerial Practices

This study can contribute in designing of advertisements highlighting the life events important from the point of view of automobile purchase for various age groups of customers. Also attractive discounts can be given during purchases at events. All these are expected to improve sales of automobiles, especially during transition from zero to one ownership state.

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