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Research Paper

Demographic Segmentation in the Travel Market: A CHAID Analysis of Traveler Profiles and Trip Attributes Among Indian Prospective Visitors

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Abstract

Demographics are central to market segmentation, as underscored in consumer behavior research. This study examines the associations between demographic factors and traveler preferences of trip attributes using 919 online surveys of prospective Indian travelers sampled conveniently but purposefully using specific filtering questions at the beginning of the questionnaire. Utilizing CHAID analysis, the study evaluates the correspondence between age, gender, marital status, income, and educational attainment with trip attributes such as outbound vs. domestic travel, accommodation type, transportation mode, travel companions, and trip duration. Distinctly, choices of travel companions correlate with education, age, marital status, and gender. Trip type, duration, accommodation, and transport have ties to specific combinations of income, education, and age. The study emphasizes the potential for leveraging these insights for precise demographic-based market segmentation in the travel sector.

Keywords: CHAID analysis, Indian travel market, market segmentation, traveler demographics, trip attributes

1. Introduction

This research context encompasses potential Indian travelers. India is forecasted to become a major economic power because of its significant economic and population growth. With a shift in revenue patterns from farm-based businesses to nonfarm-based businesses, India's rising middle class has generated a vast market (Atwal & Jain, 2012; Bijapurkar, 2007), forecasting a considerable increase in Indian tourists. Socioeconomic factors have also influenced Indian travel behaviors. The growth of India's outbound tourism market is truly unique. The foremost motivations for Indians to travel abroad are spending time with family and loved ones, a break from routine, and broadening their knowledge (Dassanayake, 2017).

The diversity of customers characterizes the modern marketplace wants and expectations, reflecting the heterogeneous nature of consumer preferences. To effectively cater to these diverse needs, market segmentation stands as an indispensable requirement within successful marketing strategies. Market segmentation involves the division of the overall market into smaller, more manageable segments, achieved through the application of specific criteria, which can be broadly categorized into observable and unobservable factors. Visible factors encompass cultural, geographic, demographic, and socioeconomic attributes, while unobservable factors delve into psychographics, values, personality traits, and lifestyle choices (Wedel & Kamakura, 2012).

Among these segmentation bases, demographic factors hold a pivotal role in market segmentation. They possess the capability to categorize the entire market into broader segments, serving as the foundational pillar for a successful segmentation process. Furthermore, demographics are widely acknowledged as primary determinants of consumer behavior, extending their influence into the domain of tourist behavior (Diamantopoulos, Schlegelmilch, Sinkovics, & Bohlen, 2003; Yacout & Hefny, 2015). In the realm of behavioral research studies, demographics have consistently emerged as significant factors (Venkatesh & Morris, 2000). This recognition underscores the potential for employing demographic factors as the basis for segmenting the travel market.

However, when considering the complexities of the travel market, demographic factors and trip-related attributes alone may prove insufficient for successful segmentation. An integrated approach is essential to understand how traveler demographics interact with trip-related facts. In response to this critical need, this research study examines visitor demographics as predictive elements of their travel behavior. Specifically, we investigate how demographic characteristics relate to trip-related attributes, including travel companions, trip duration, choice between domestic and outbound travel, type of accommodation, and mode of transportation.

The primary motivation behind this examination lies in assessing the potential of demographics as facilitators of market segmentation alongside trip-related attributes. By comprehensively analyzing traveler demographics, we can identify distinct travel behaviors, allowing for the categorization of travelers into broader segments based on demographic variables. For instance, the choice of accommodation type may be influenced by gender, enabling the division of the market into two distinct parts. The subsequent sections, starting with the literature review, will delve into the concept of market segmentation and explore the intricate relationship between traveler demographics and their behaviors. Following the literature review, the research methodology will be detailed, findings presented, and conclusions drawn based on the results.

2. Literature Review

2.1 Market Segmentation

A diverse range of literature is found about market segmentation. Every company or organization should define the market it is in or expects to be in and understand how that market can be divided into groups with similar customer needs (McDonald, 2012). Thus, segmentation is defined as the process of dividing a homogeneous market into homogeneous groups. (Goyat, 2011). A single consumer feature, such as age, gender, country of origin, or family life cycle phase, can be the segmentation criterion. It can also contain a wider range of consumer features, such as the number of benefits sought in buying products, the number of businesses on holidays, environmental values, or a pattern of expenditure (Dolnicar et al., 2018; Otoo et al., 2020). Demographic factors are considered essential but crucial among the various criteria applied in market segmentation (Tran et al., 2019). Gender, income, age, education, and marital status have all been identified as potential market segmentation factors in general (Alfansi, & Sargeant, 2000; Lee, Bai, & Murphy, 2012). In the tourism and hospitality literature, there is also evidence for using demographics in market segmentation (Juaneda, & Sastre, 1999; Otoo et al., 2020).

2.2 Demographics and Travel Behaviour

It is crucial to understand how demographics influence travel behavior when segmenting the travel market by demographics. The sociodemographic background of the visitor can influence their travel behaviors. Zhang, Qu, and Tang (2004) found a relationship between a range of demographic factors (gender, age, marital status, education, and income level) and the respective travel behavior. Age is a significant predicting factor in behavioral research in many instances. Moreover, many studies have revealed the difference between the age groups of visitors regarding destination selection and travel behavior (e.g. Bjork & Kauppinen-Raisanen, 2011; Hui & Wan, 2003; Kattiyapornpong & Miller, 2011; Kurgun, 2010; Lee, Huang, & Chen, 2010; Lee & Gross, 2011; Zhang et al., 2004). Moreover, some other studies have shown that there are differences between male and female travelers in terms of travel patterns and behaviors, demonstrating the notion of gender differences in travel (e.g. Birgit, 2001; Lee & Gross, 2011; Ross, 1993; Shanka & Phau, 2008; Zins, 2010). Other than gender and age, other sociodemographic parameters have also been shown to be linked to travel characteristics. Out of which, marital status (e.g. Shanka & Phau, 2008), level of education (Hui & Wan, 2003; Kurgun, 2010; Lee et al., 2010; Lee & Gross, 2011; Ross, 1993; Zhang et al., 2004), level of income (Kattiyapornpong & Miller, 2011; Lee et al., 2010; Lee & Gross, 2011; Zhang et al., 2004), and country/region of origin are notable.

2.3 Demographics and Trip Attributes

Recognizing the significance of demographics in market segmentation and their association with travel behavior, it becomes essential to explore how demographics correlate with travelers' trip attributes, an essential facet of travel behavior. A specific trip can get a different attribute depending on the choice of the traveler (Shelat et al., 2018). These attributes generally include the choice of accommodation, outbound vs. domestic trip, length of stay, trip planning time-frame, travel companions, first-time vs repeat visit, and travel information (Cai et al., 2004; Pearce & Schott, 2011; Schul & Crompton, 1983; Barros, Butler, & Correia, 2008; Hong, Lee, Lee, & Jang, 2009; Seddighi & Theocharous, 2002; Bronner & de Hoog, 2011; Teichmann, 2011). The literature has also looked into the relationship between demographics and trip attributes. A study conducted by Yoo, McKercher, and Mena (2004) on visitors to Hong Kong tested the cross-cultural differences using demographic factors such as age, gender, level

of education, and income in conjunction with trip attributes such as mode of transportation, trip duration, and travel party size and the researchers found that there are statistically significant associations between demographics and trip attributes.

Furthermore, Cannon and Ford (2002) and Sovacool et al. (2018) assert that the demographics of travelers can influence their purchasing patterns during a trip, while Alegre and Pou (2006) discover that the demographics of travelers can influence the length of time spent on a trip. Demographic characteristics can also have an impact on the type of travel that is planned (Sung, Morrison, Hong, and O'Leary, 2001). Birdir (2015) segmented the visitors to Istanbul based on their demographics to identify the visitors' profile.

In the literature, the interaction between demographics and travel attributes has been investigated using a variety of data analysis and data mining techniques. Legohérel, & Wong, (2006) performed a CHAID analysis to segment the market based on the international travelers' distinctive spending habits in Hong Kong in order to identify the big spenders. Hsu and Kang (2007) conducted a CHAID analysis to segment the market using age and income factors with travelers visiting Hong Kong and concluded that sociodemographic factors can determine the length of stay and travel companions.

According to the findings of the studies on traveler demographics and trip attributes, demographic elements and trip attributes are regularly incorporated into travel behavioral research. More crucially, some studies have indicated that the demographic characteristics of the individual traveler in question influence the attributes of a journey. However, systematic investigations, particularly in terms of data analysis techniques used to see the interactions between demographic and trip attributes, are very limited in the literature. Thus, this research paper analyzes data using a new data mining technique to test the interactivity between demographics and trip attributes as an approach for travel market segmentation in a broader context. Moreover, the study of the Indian travel market is another contribution of this research, as the Indian market is known as one of the biggest travel markets in the future.

3. Methodology

3.1 Research Design and Questionnaire

Anchored in objectivism and post-positivism as epistemological foundations that originated on ontological realism, this research employs a quantitative approach, using a survey strategy for data collection. The research utilized a cross-sectional design, gathering data via an online questionnaire. A combination of convenience sampling method with purposive sampling was employed, with specific filtering questions designed to target the appropriate respondents. These questions aimed to identify Indian travelers who intend to undertake a leisure-oriented trip within the next six months, representing the study's population.

The questionnaire comprised sections capturing respondent demographics and various trip-related characteristics. Demographic inquiries covered gender, education level, occupation, marital status, age, and monthly income. Trip attributes encompassed type of accommodation, trip duration, travel companions, domestic vs. international travel, and transportation mode. For all questionnaire items, respondents were restricted to selecting only one option, with all choices being categorical. This study utilized the responses from 919 potential Indian travelers with prospective travel plans.

3.2 CHAID Analysis

The relationship between travelers' demographics and trip characteristics was analyzed using the CHAID method and the tree diagram feature in SPSS. CHAID analysis is one of the decision tree techniques that can be used to discover statistically significant relationships between one dependent variable and more than one independent variable (Avsar & Yalçin, 2015; Kagnicioglu & Mogol, 2014; van Diepen & Franses, 2006). Because the demographics of travelers and the attributes of their trips are either nominal or ordinal, CHAID analysis was chosen above other related techniques such as CRT (Classification and Regression Trees) and other similar techniques (Berry & Linoff, 2004). When respondents for a target variable can be divided into significantly different groups based on a predictor variable, the CHAID test generates hierarchical nodes for each predictor variable concerning the provided target variable (Berry & Linoff, 2004). Here, the statistically significant difference is determined by the p-value, which is calculated by a statistical test and compared with an established threshold (Kagnicioglu & Mogol, 2014; Rokach & Maimon, 2007).

When classification is conducted, the nodes with the highest chi-square value are put at the top of the diagram, and the nodes with the lowest chi-square value are placed at the bottom (Althuwaynee, Pradhan, Park, & Lee, 2014). When using this particular test, it is possible to combine categories in the predictor variables in order to identify meaningful classifications in the target variable (van Diepen & Franses, 2006). This study takes into account six demographic variables (gender, age, marital status, level of education, occupation, and monthly income) as well as five trip attributes (domestic versus international trip, length of stay, travel companions, type of accommodation, and mode of transportation). The CHAID analysis was carried out using IBM SPSS statistics (version 24); each of the six independent variables (demographic variables) was combined with one of the six dependent variables at a time to produce the CHAID equation.

4. Data Analysis and Results

4.1. Travel companions as the target variable

The output of the CHID analysis with the travel companions as the target variable is shown in Figure 1. Accordingly, one's selection of travel companions is influenced by the level of education, age, marital status, and gender. Further, education level is the dominant factor in determining the travel companions according to the results ($\square 2 = 195.09$, $df = 15$, $p<0.05$). Bachelor's degree holders, high school, and diploma holders prefer to travel with friends as master's degree holders, and professionally qualified people prefer to travel with their family members. Interestingly, people with some school education prefer traveling alone. The second-level nodes demonstrate two predictor demographic factors: age and marital status. Amongst the bachelor's degree and diploma holders, the age groups 18-25 and 56-65 prefer traveling with friends, whereas the age groups 26-35, 36-45, and 46-55 prefer traveling with family members ($\square 2 = 46.30$, $df = 5$, $p<0.05$).

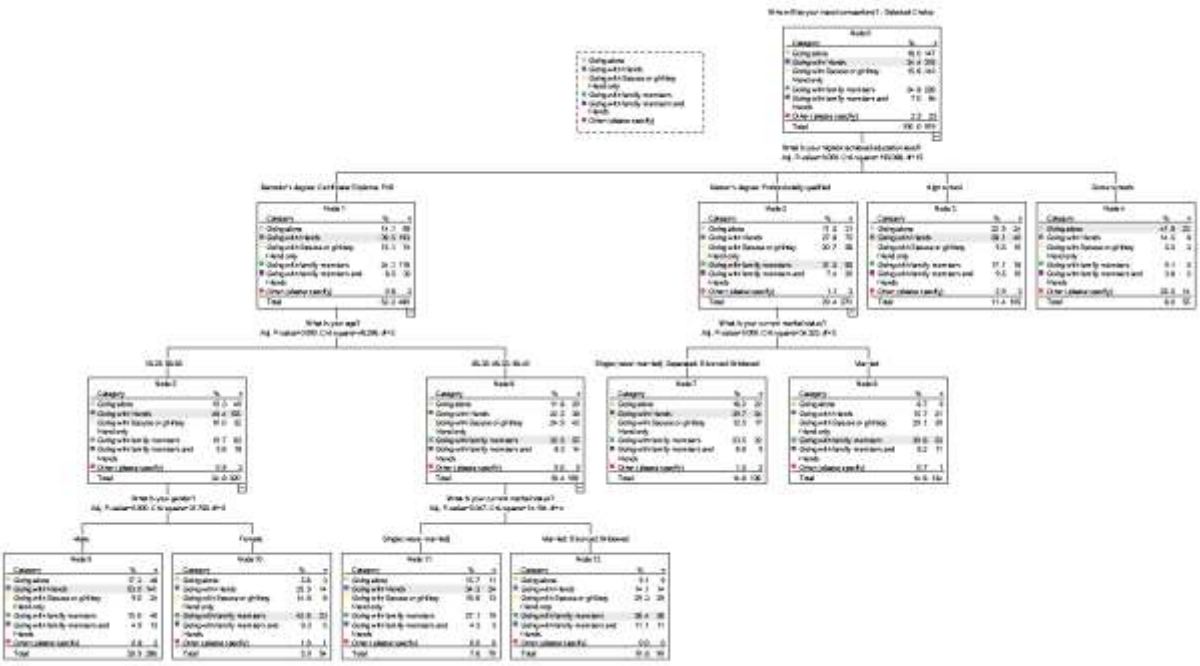

Figure 1. CHAID Results – Demographics vs. Travel Companions

With respect to marital status, among the masters' and professional qualification holders, the groups single, never married, and separated people select their friends as the travel companions and the married people travel with family members (χ^2 =34.32, *df* =5, p<0.05). The third level nodes of the tree diagram output have derived the age and marital status as the predictors in determining the travel companions. Amongst the bachelor's degree and diploma holders and the age groups 18-25 and 56-65, the male travelers prefer traveling with friends, whereas the female visitors like to travel with family members (χ^2 =31.76, *df* =5, p<0.05). With regard to marital status, amongst the bachelor's degree and diploma holders and the age groups 18-25 and 56-65, the married travelers prefer traveling with family members, whereas the unmarried visitors like to travel with friends (χ^2 =14.20, *df* =4, p<0.05).

4.2. Length of trip as the target variable

The length of the trip, when used as an outcome variable, produced only one level of nodes, suggesting that demographic factors might have a limited influence on the trip duration.

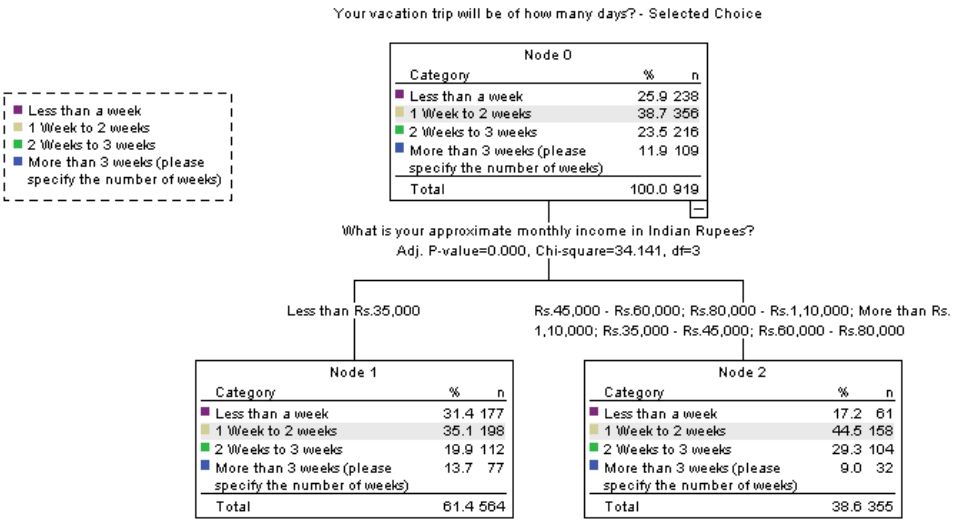

Figure 2. CHAID Results – Demographics vs. length of trip

However, according to the results, income has been the prime factor in determining the length of stay of the prospective journey (χ^2 =34.14, *df* =3, p<0.05). Moreover, while the majority of the respondents preferred the trip time from 1 week to 2 weeks, the lesser-income people had to limit their trips to less than one week.

4.3. Mode of accommodation as the target variable

According to Figure 03, the demographic factors determine the mode of accommodation of the prospective trip. Level of education has been the prime factor in selecting the type of accommodation (χ^2 =87.03, *df* =4, p<0.05). Even though the highest percentage is found with respect to hotel accommodation in every category, bachelor's degree and master's degree holders prefer more in hotel accommodation. Furthermore, at the second level of nodes, age has been found to be a significant predictor of accommodation selection in which the age groups 18-25 and 56-65 prefer staying with friends and relatives other than the hotels (χ^2 =20.24, *df* =2, p<0.05).

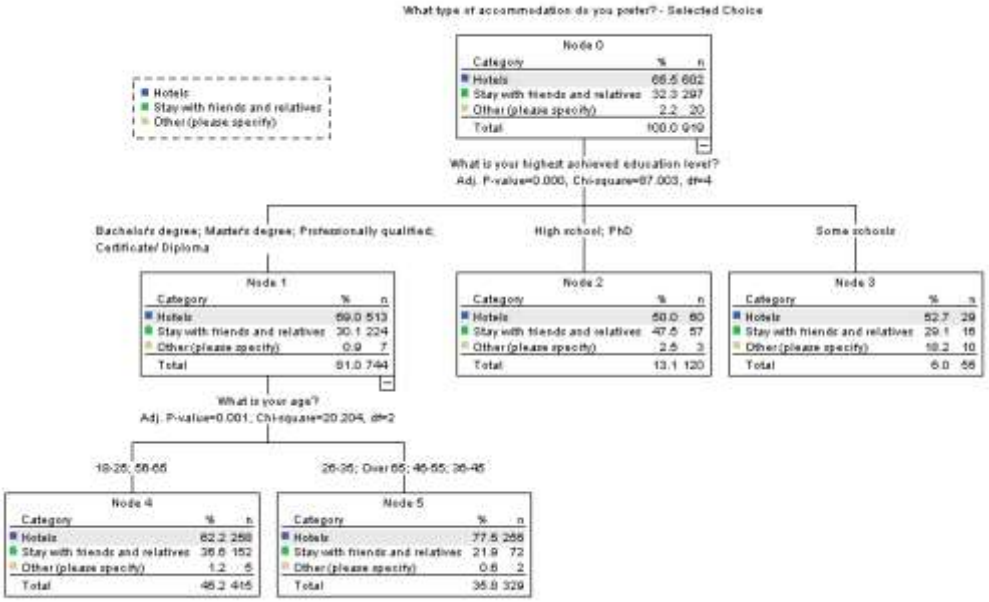

Figure 3. CHAID Results – Demographics vs. mode of accommodation

4.4. Mode of transportation as the target variable

The tree diagram depicted in Figure 04 shows that the income level of travelers determines the mode of transportation of the prospective trip (χ^2 =109.48, *df* =6, p<0.05).

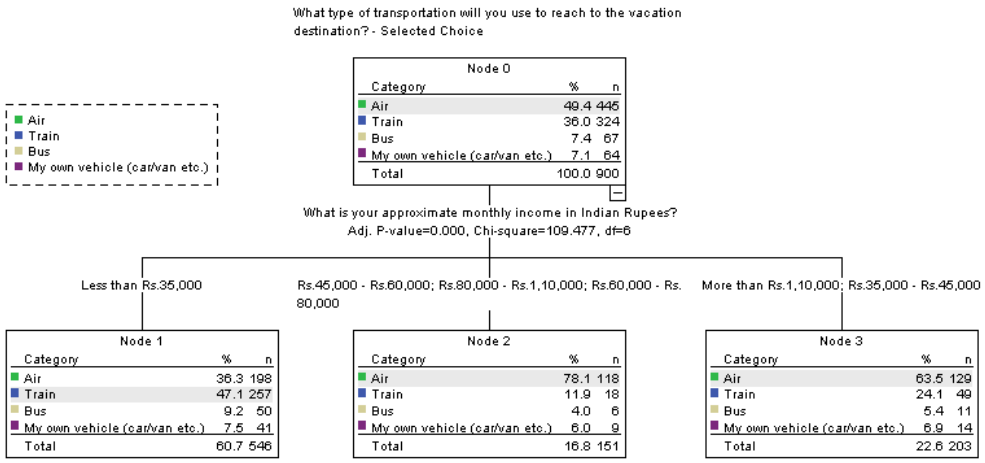

Figure 4. CHAID Results – Demographics vs. mode of transportation

According to the results, for those with less income, travelers choose mainly the train transportation, whereas other income categories go for the air transportation modes for their trips.

4.5. Outbound Vs. Domestic as the target variable

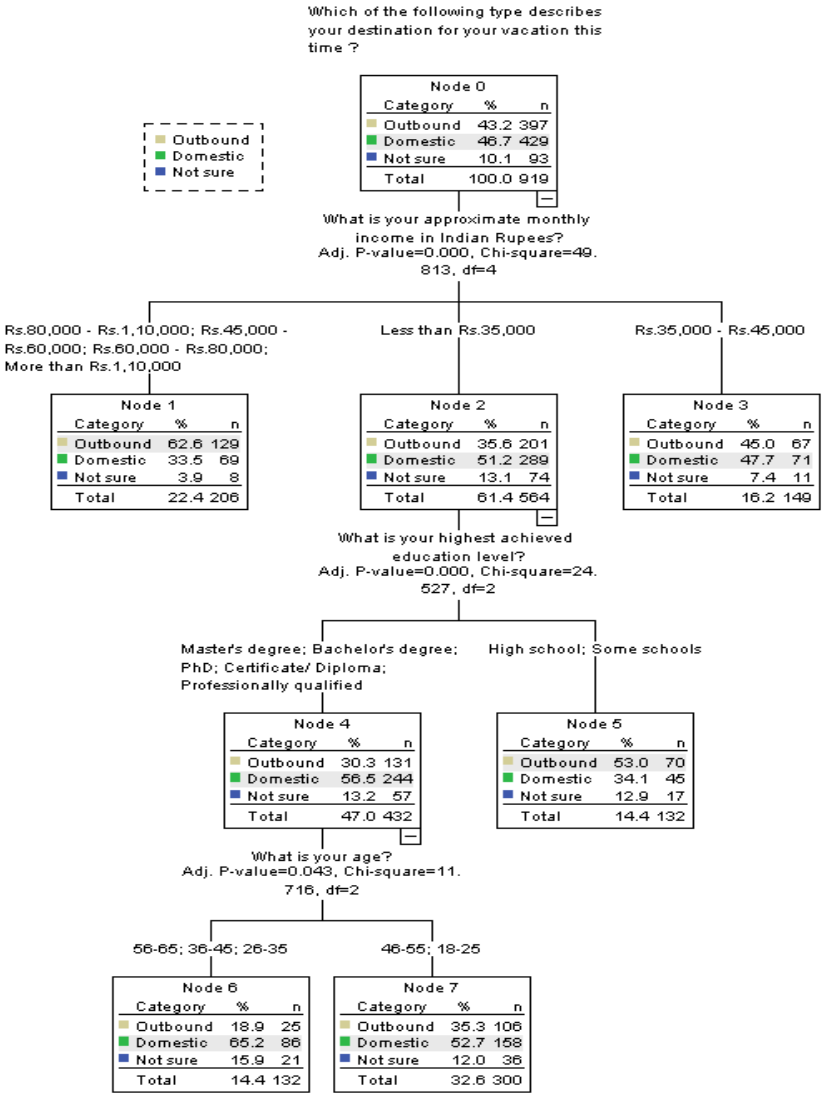

Figure 5. CHAID Results – Demographics vs. outbound and Domestic Visits

The level of income has been the most important factor in deciding whether to go on an outbound or domestic trip. People with higher incomes are more likely to travel abroad than those with lower incomes. (χ^2 =49.81, *df* =4, p<0.05). Moreover, with regard to the second level of the nodes, the education level has determined where to go (χ^2 =24.53, *df* =2, p<0.05).

Finally, at the third level of the diagram, age has been identified as a factor in determining whether an outbound or domestic trip should be taken. (χ^2 =11.72, *df* =2, p<0.05).

5. Discussions Conclusions

In the complicated interaction between demographics and travel behaviors, this research paper probed deeply, utilizing the CHAID data mining technique. The objective was clear: to explore the extent to which demographic factors shape travel preferences and behaviors. The results provided illuminating insights. It was evident that travelers' demographic profiles could predict, with a high degree of statistical confidence, pivotal trip attributes. These encompassed not just choices of travel companions but also preferences in accommodation, transportation modes, trip durations, and even the choice between domestic and outbound journeys. A striking revelation was the profound influence of demographics on the choice of travel companions, a finding echoed by Arroyo et al. (2020) and Dassanayake (2017). (2011). Investigating the specifics, Arroyo et al. (2020) highlighted age, gender, education, and marital status as the cornerstone demographics influencing these decisions. This seamlessly aligns with the assertions of Hsu and Kang (2007), who believed that choices about travel companions are primarily dictated by age and income. Additionally, Smith and Costello (2009) weighed in on the discourse, noting that older individuals and those with a more robust disposable income often prefer traveling as couples. This observation harmonizes perfectly with our findings, which revealed a propensity for married couples to travel with their families.

Transportation preferences, especially when traveling, often hinge on economic factors. One critical determinant, as research has consistently shown, is the traveler's income. It is not merely about affording transport but also the comfort, convenience, and prestige associated with specific modes of transportation (Tang et al., 2020). The choice between outbound and domestic travel appears to be multi-dimensional. Monthly income, educational attainment, and age play pivotal roles in shaping these preferences (Zeng & Go, 2013). A clear trend emerges: individuals with higher incomes display a propensity for international or outbound travel. On the other hand, those with comparatively modest incomes lean towards domestic travel. This could be attributed to budget constraints but also the appeal and familiarity of local destinations (Song et al., 2019).

Given the results, it is evident that their demographic factors determine the trip attributes of prospective visitors. However, according to the results, not all demographic factors equally impact all forms of trip attributes. Nevertheless, the overall results indicate that demographics are useful in segmenting the market in a broader sense. Past research studies (Weaver et al., 2007) have claimed that demographics have certain associations with trip attributes. This study links the association of demographics and trip attributes with the destination decision-making process of prospective visitors. The significance of this linkage is that trip attributes (with friend vs. family, foreign vs. domestic, shopping vs. sightseeing, etc.) can determine the types of destinations that will be considered for a given vacation requirement in the developing early consideration set, as occurs in the destination decision-making process. No other study has identified the outset of this relationship.

6. Implications, imitations, and Future Research

This research provides invaluable insights for both academia and tourism stakeholders. The conversation leading to demographic and travel behavior is extended with the findings of this research as it clearly demonstrated the link between demographic factors and trip planning behaviors, confirming that the demographics are still valid in respective market segmentations. So, for travel and tourism practitioners, it opens avenues for more personalized and effective marketing campaigns that can specifically target the relevant segment of the market. Insights into the preferences of different demographic groups can be instrumental in designing targeted promotions and optimizing both resource allocation and potential revenues.

However, while the findings are robust, they come with inherent limitations. The efficiency of the CHAID data mining technique is contingent upon the quality of input data, and the purposive sampling techniques can have specific concerns about the validity of findings even though the sample size is comparatively larger. The particular context of the study might also not make it universally applicable across varied cultural and regional landscapes.

Given these revelations, the door is open for more nuanced future research, exploring deeper reasons behind travel preferences and how they might adapt to changing global conditions. Such endeavors could further deepen the industry's grasp of its multifaceted clientele.

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