Araştırma Makalesi

Characteristics Of Jewelry Purchasing Households: A Machine Learning Perspective

Mücevherat Satın Alan Hanelerin Özellikleri: Makine Öğrenmesi Perspektifi

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Abstract

With an ever-growing market, sized over $300 billion annually, jewelry consumption has a significant place in luxury consumption. Jewelry marketing and consumption are usually studied from a causal perspective, as the most frequent question can be defined as "why do people buy jewelry?" in literature. This study offers a different perspective as the research question of this paper is "what are the characteristics of the households who purchase jewelry in Turkey?". Three years of household spending data was collected from the Turkish Statistical Institute (TÜİK) and inflation adjusted. Then data is classified using cluster analysis to detect major groups in data, and then the CHAID algorithm is used for conducting decision trees. To the best of the authors' knowledge, the methodology is unique in jewelry marketing literature. Research findings show that lower and middle-income households show a tree form, and sub-branches are found and the most and the least likely household types are identified: lower and medium-income households with younger and higher educated house heads are more likely to purchase jewelry, and the least likely groups are those with house heads who are less educated and aged over 60, whereas higher-income households look homogenous in terms of jewelry buying behavior.

Keywords: Marketing Research, Luxury Consumption, Jewelry Consumption, Machine Learning, CHAID.

Jel Codes: M31, C23, D12

Öz

Yıllık olarak 300 milyar dolar'dan büyük ve büyümeye devam eden mücevherat pazarı, lüks tüketimde önemli bir yere sahiptir. Mücevherat pazarlaması ve tüketimi literatürde daha çok nedensellik perspektifinde, "insanlar neden mücevher alır?" benzeri sorularla ilgilenilmiştir. Bu çalışma, araştırma sorusu olarak "Mücevher satın alımı yapılan hanelerin karakteristik özellikleri nedir?" sorusuyla farklı bir perspektif sunmaktadır. Çalışmada Türk İstatistik Kurumundan (TÜİK) alınan üç yıllık hanehalkı harcama verileri kullanılmış ve kullanılan veriler enflasyondan arındırılmıştır. Ardından kümeleme analiziyle eldeki veri sınıflandırılmış, sonrasında ise CHAID algoritmasıyla karar ağacı oluşturulmuştur. Yazarların bilgisine göre bu metodoloji mücevherat pazarlaması alanında daha önce kullanılmamıştır. Çalışmanın sonuçlarına göre orta ve düşük gelirli hanelerde ağaç yapısı ve dallanmalar bulunmuş, mücevher satın alma olasılığı en yüksek ve en düşük hane tipleri belirlenmiştir: genç ve yüksek eğitimli hane reislerine sahip düşük ve orta gelirli hanelerin mücevher satın alma olasılığının daha yüksek olduğu görülürken en az olası grupların ise daha az eğitimli ve 60 yaş üstü hane reisinin bulunduğu haneler olduğu görülmüştür. Yüksek gelirli hanelerin mücevher satın alma davranışı açısından homojen olduğu görülmüştür.

Anahtar Kavramlar: Pazar araştırması, lüks tüketim, mücevherat tüketimi, makine öğrenmesi, CHAID.

Jel Kodları: M31, C23, D12

1. Introduction

The global jewelry market size of $330 billion, in 2019 (Fortune Business Insights, 2021) and jewelry being globally recognized as a status symbol, it has a significant place in luxury consumption. It is believed that due to the growing global economy and consequently an increase in households' disposable income has been an important factor for the gradually growing demand for jewelry (Fortune Business Insights, 2021).

As an industry, the global luxury jewelry market worth was over $21 billion and 36,8% of the demand was attributed to gold jewelry in 2020 (Shahbandeh, 2021). This shows that luxury consumption is an important part of jewelry purchases in general. Similarly, gold jewelry represents the largest portion of gold demand with 50% annually (World Gold Council, 2020). Before COVID-19, the size of the jewelry industry was expected to reach over $480 billion in 2025 (MOF Team, 2021). With COVID-19 shaping buyer behavior all around the world in almost every market, the jewelry industry does not appear to be an exception either. As online purchases become more and more mainstream in almost every industry, especially younger jewelry buyers are expected to make a gradual shift to online shopping (TJM, 2021).

Archeological evidence shows that interest in jewelry in modern-day Turkey's soil dates back to 40.000 B.C. (Kuhn, Stiner, Reese, and Erksin, 2001), based on the latest findings. Today, statistics show that about 5% of the households in Turkey are jewelry buyers according to the Turkish Statistical Institute (will be referred to as TÜİK hereafter), based on 2017-2019 records (TÜİK, 2017; TÜİK, 2018; TÜİK, 2019). Being a luxury good and increasing household disposable income indicates that jewelry purchase should positively correlate with household income. Though jewelry is a luxury good, in Turkey it is also bought and gifted for cultural and traditional reasons on occasions like weddings, births, new home visits, and numerous other reasons. Being indicated that jewelry purchases are considered a form of luxury consumption in general, and it is related with households' disposable income, luxury consumption and disposable income terms need more elaboration in this context. In simplest terms, luxury consumption can be defined as the act of purchasing or rather consuming (using) luxury goods. Luxury goods are defined as goods that are not necessary, yet purchased for pleasure or comfort in Collins Dictionary (2021), and jewelry is given as an example in Cambridge Dictionary (2021). Also, they are categorized as a form of specialty goods and they usually go with high prices and therefore their consumption depends on the income level and consequently the disposable income of the person or household (Kotler and Armstrong, 2021). Disposable income, on the other hand, is defined as the income that can be spent or saved after necessary payments are made such as taxes, food, and rent payments (Cambridge Dictionary, 2021). Similarly, OECD defines household disposable income as "the income of households after taking into account net interests and dividends received and the payment of taxes and social contributions" (OECD, 2021). The definitions of the concepts suggest that a higher household disposable income means higher consumption of luxury goods, such as jewelry. Although it is known that the frequency of jewelry consumption increases with the income level, the difference between buyer and non-buyer households are not clear. This raises an important question: what are the differences between jewelry purchasing households and non-purchasing households for different income levels? In other words: who are the potential jewelry customers in different income groups?

Being able to identify households with a higher probability of jewelry purchase should help marketers to target potential buyers more efficiently. This study aims to find out the factors that increase the likelihood of jewelry purchase behavior for households from different income groups. Also, despite there is a rich literature on luxury goods consumption, there is only a

handful of papers on jewelry consumption and even fewer on jewelry consumption in Turkey. This paper aims to help fill the gap of the lack of research on jewelry consumption in literature as well.

2. Literature Review

One of the first notable publications on jewelry marketing by Morton R. Sarett (1960), divided the jewelry market into three major segments: Christmas-gift market, bridal market, and gift market. However, in the modern-day, consumers tend to buy jewelry for numerous other reasons and occasions too. In more than half a century since Sarett's research, scholars mainly attempted to find out why, and under what conditions do consumers buy jewelry. Attributes that contribute to customers' jewelry purchase decisions can be divided into two: tangible and intangible attributes (Sanguanpiyapan and Jasper, 2010). Tangible attributes are mainly their marketing mix, and intangible attributes are about self-actualization needs. Conclusions by Sanguanpiyapan and Jasper on intangible attributes are in line with Truong and McColl's (2011) study where they indicate that desire for quality, self-rewarding experience, and self-esteem are among important motivators for luxury consumption. Jotikasthira and Onputtha (2017), on the other hand, attempted to build a general model by examining factors that associate with jewelry purchase decisions. They found out that tangible factors such as price, product design, and demographics influence consumers' purchase decisions. Although the motives behind jewelry consumption are identified by different scholars, it is also known that consumer behavior in the luxury market is changing (Amatulli and Guido, 2012; Silverstein and Fiske, 2003;) and being one of the four major luxury product groups defined by Fionda and Moore (2009), the jewelry market is no exception (Kumara and Kumar, 2016). In order to cope with an ever-changing environment, it is essential to understand and find out not only why customers purchase jewelry, but also who are the potential jewelry customers.

Also, there are studies present that focus on jewelry marketing in one or a few specific markets. Sanchez-Gutierrez et al. (2008), inspected the effect of CRM and marketing efforts on the jewelry industry in Mexico. Simoni, Rabino, and Zanni (2010), inspected how Indian and Italian SMEs are marketing their products in the USA market and found out that Indian companies try to expand the Indian immigrant community in the USA, whereas Italian SMEs concentrate on competition in a reactive manner. Li and Yin (2011) studied Chinese consumers' jewelry purchase motivations and found out that elder individuals buy less jewelry, also higher-income individuals buy jewelry for self-gratification and status-related motivations. Amelia and Hudrasyah (2016) studied consumers' jewelry purchase motivations and showed that jewelry consumers in Indonesia are motivated by self-identity, status, and uniqueness. Hani et al. (2018) studied the effect of celebrity endorsement on jewelry customers' purchase intention and found out that mark inclination has a negative relationship with celebrity endorsement.

Lately, various new perspectives and horizons are added to the literature on jewelry marketing and consumption. One of the most significant of the studies, if not the most significant, links jewelry shopping with obesity and compensatory consumption (Kurt, 2021). Kurt, in her ground-breaking research, found out that individuals with relatively higher body mass indices were more willing to pay a higher price for jewelry and that jewelry shopping was a form of compensatory consumption for those who are less than happy with their physical appearance or weights. Another interesting study rather suggests a future direction for jewelry consumption. Silina and Hsu (2018) pointed out that jewelry items are known to hold sentimental value, yet social wearables are usually gadget-like utilitarian goods and suggested that finding a way to combine those two concepts could give way to a new breed of wearable digital jewelry. The concept was also studied by Salmela and Vimm (2018). They pointed out that even though "digital smart jewelry" has significant business potential and some genuinely interested potential and current buyers exist, what would happen after the initial interest is still uncertain.

Literature on jewelry marketing in Turkey is relatively thin, yet there are notable papers studying different aspects of jewelry consumption and marketing. Ulutürk and Asan (2016), offered a model for luxury purchase behavior and argued their research is a preliminary research for jewelry marketing. Çatalbaş and Duru (2019) offered a review of the design, production, and marketing of jewelry. They argue that prices can be the main factor for jewelry marketing. Another paper studying marketing of jewelry offers a general view on jewelry purchase behavior in Konya (Nalçacıgil and Özyılmaz, 2020). Nalçacıgil and Özyılmaz found out that the main reasons to purchase jewelry and gold include but are not limited to tradition, gifts, and wealth presentation.

As it can be observed from the literature review, most of the literature on jewelry marketing is concentrated on reasons of jewelry purchase by customers who already intend to buy jewelry. Besides that, studies suggest that jewelry purchase behavior has a positive correlation with wealth and a negative correlation with age. This study, on the other hand, aims to shed light on how to find out likely jewelry buyers in lesser income groups in particular. It is known from the past literature that the wealthy are more likely to purchase jewelry. However, though not as frequent as higher-income households, jewelry is purchased by middle and lower-income households too.

This study is unique in two ways by filling gaps in the literature. First, it aims to provide insight on where to look at amongst the lower-income groups for potential jewelry buyers. Second, by using panel data, this study aims to provide information on jewelry purchases by rather than concentrating on individuals, but by examining data representing households in Turkey.

3. Data And Method

3.1. Data

Data of the study are provided by TÜİK's household budget survey between 2017-2019. Data includes responses from 35515 households (TÜİK, 2017; TÜİK, 2018; TÜİK, 2019). Disposable income data are inflation-adjusted using December 2019 figures and preprocessing and arranging were made. Descriptive statistics belonging to the data are presented in Table 1.

Table 1: Variables and Descriptive Statistics

Variable	Categories	Total		Purchasing Households	
		Frequency	Percentage	Frequency	Percentage
Jewelry purchase	Yes	33758	95.05	1757	100
	No	1757	4.95	-	-
Marital status of head of household	Single	6748	19.00	285	16,22
	Married	28767	81.00	1472	83,78
Occupational status of head of household	Unemployed	12635	35.58	502	28,57
	Employed	22880	64.42	1255	71,43
Gender of head of household	Female	6280	17.68	308	17,53
	Male	29235	82.32	1449	82,47
Age of head of household	15-29	2077	5.85	128	7,29
	30-44	11072	31.18	680	38,70

	45-59	12033	33.88	695	39,56
	60 or above	10333	29.09	254	14,46
Educational status of head of household	Uneducated	4192	11.80	84	4,78
	Primary school	19650	55.33	774	44,05
	High school	6033	16.99	356	20,26
	University or higher	5640	15.88	543	30,90
6-18 aged member present in household	No	20361	57.33	870	49,52
	Yes	15154	42.67	887	50,48
0-5 aged member present in household	No	27127	76.38	1288	73,31
	Yes	8388	23.62	469	26,69
Average annual disposable income (household)		67837.22 TL		101138.36 TL	
Average household population		3.43 persons		3.69 persons	

3.2. Method

In this study, a modeling process is exercised by using machine learning methods. The methods used in this study differ from those used in similar studies as it consists of cluster analysis and decision trees which are used for identifying the factors that influence jewelry purchase of a household. It is hoped that this study brings a new perspective with its method that is used for the first time in jewelry marketing studies to the best of authors' knowledge.

The first component of the methods used in the study is cluster analysis. The main goal of cluster analysis is to find out sub-groups in a data collection and cluster them together. A well-executed clustering algorithm is expected to identify the clusters within the studied data correctly and profoundly (Nisbet, Elder, and Miner, 2018). It is expected to observe the high similarity between cases within clusters and the low similarity between cases with other clusters. In other words, clusters are expected to contain homogenous cases within themselves, and they are expected to be heterogeneous between one another. Because cluster analysis does not include a pre-determined class label, it is considered an unsupervised machine learning method (Ghosh, 2003).

The cluster analysis method has been used in a wide range of fields in literature, including but not limited to finance (i.e., Elton and Gruber, 1970; Rubanov, Vasylieva, Lieonov, and Pokhylko, 2019), psychology (i.e., Clatworthy, Buick, Hankins, Weinman, and Horne, 2005; Paykel, 1971; Pilowsky, Levine, and Boulton, 1969), medicine (i.e., Barchitta et al., 2021; Vazquez Guillamet, Ursu, Iwamoto, Moseley, and Oprea, 2018; Wismuller et al., 2002), and management (i.e., Bach, Jaklič, and Vugec, 2018; Bose and Chen, 2010; Fourati-Jamoussia and Niamba, 2016). Because it is beneficial and, in some cases, essential to group customers based on their characteristics or behaviors, the cluster analysis method has been used in marketing as well. Some of the earlier marketing papers that used cluster analysis are provided by Green et al. (1967), Frank and Green (1968), Christopher (1969), and Guiltinan (1970).

In this study, households are clustered based on their disposable household income by using a two-step cluster analysis. Clusters identified with the cluster analysis are labeled as low-, middle- and high-income households. Detailed results of cluster analysis are shown in Table 2.

Table 2: Cluster Analysis Results

	Low	**Middle**	**High**
Number of households	25340	9654	521
Percentage of households	71.4	27.2	1.5
Average monthly disposable income	3647.72 TL	9480.55 TL	32267.71 TL
Average annual disposable income	43772.64 TL	113766.56 TL	387212.46 TL

The second leg of the method used in this study, decision trees refers to the machine learning method that is used in classification and regression problems (Rokach and Maimon, 2015) that hierarchically divides data until the lowest possible level specified by class labels (Lee, Liu, and Jin, 2015). Because of its ease of use and interpretation (Lee et al., 2015) decision trees are frequently used in applied sciences such as finance, marketing, engineering, and medicine (Rokach and Maimon, 2015). The most distinctive variables are expected to be in the higher levels of the tree because of the decision trees' working principles (Bajcsy, Han, Liu, and Yang, 2005). There are various algorithms that run with decision trees, such as ID3, CHAID, QUEST, CAL5, FACT (Han, Kamber, and Pei, 2012; Rokach and Maimon, 2015). Decision trees are classified based on the nature of data they work with, classification method and/or availability to be used in regression problems, the number of branches, splitting criteria, etc. (Palmer, Jiménez, and Gervilla, 2011). The aim of decision tree algorithms is to minimize generalization error and minimize average depth (Rokach and Maimon, 2015). In this study, CHAID is used for its unique advantages. The name CHAID is an acronym for "Chi-Square Automatic Iteration Detector", and it is an upgraded version of AID algorithm (Donskoy, 2013). CHAID was developed in 1980 by Kass. It uses chi-square test for classification problems and f-test if the target variable is a continuous variable (Nisbet et al., 2018). In other words, the test used in the algorithm depends on the type of the dependent variable. F-test is used with continuous variables, Pearson chi-square test is used with nominal variables, and likelihood ratio test is used with ordinal variables (Rokach and Maimon, 2015). CHAID has been used in many scientific research areas such as education (Burley, England, and Beran, 1996; Zırhlıoğlu, 2011), tourism (Agapito, Mendes, and Valle, 2011; Díaz-Pérez, Fyall, and Fu, 2021), and medicine (Chan, Cheing, Chan, Rosenthal, and Chronister, 2006; Fernández, Mediano, García, Rodríguez, and Marín, 2016). It is also favored by marketing scholars because of its ability to produce wider trees compared to C&RT (Clark, Deurloo, and Dieleman, 1990; Deurloo, Dieleman, and Clark, 1987). Despite it providing wider trees, CHAID has its own disadvantages such as requiring relatively larger data for reliable results, and the difficulty of associating multiple sections with real-world conditions (Nisbet et al., 2018).

4. Results

Based on CHAID analysis, income, educational level of head of household, age of head of household, gender of head of household, presence of individual(s) aged 0-5, presence of individual(s) aged 6-18, size of the house, and car ownership characteristics are found relevant with jewelry consumption, whereas marital status of head of household, occupational status of head of household, house ownership, and summerhouse ownership were found not relevant. The created decision tree is visualized in Figure 1, Figure 2, and Figure 3.

Conclusions reached from decision tree interpretation are explained respective to their position on the decision tree. The root node shows that the number of households that bought jewelry is 1757. This figure is 4.95% of total households. The first divisive variable, in other words, the most significant variable that influences jewelry purchase, is found out to be disposable household income. As illustrated in Figure 1, jewelry buying households within lower-income

level is 3.22%, jewelry buying households within medium income level is 8.85%, and jewelry buying households within higher income level is 16.51%. These results are in alignment with the literature as the higher the income, the higher the percentage of jewelry purchasing households.

Figure 1: CHAID Analysis Overview
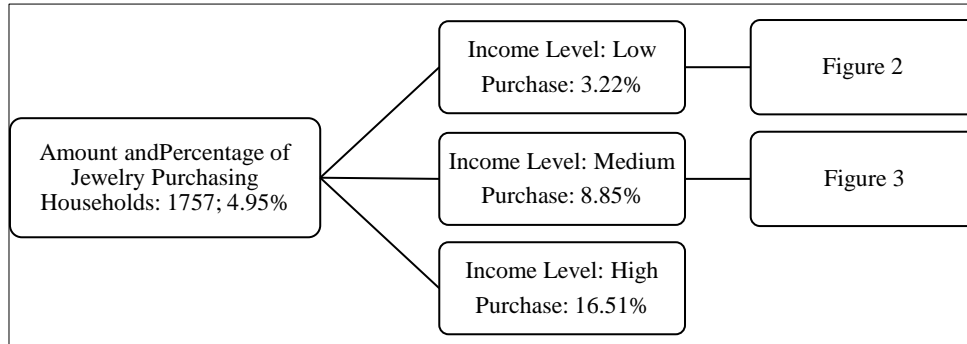
The decision tree under lower income level is shown in Figure 2. When sub-nodes of lower-level income are inspected, it can be seen that the age of the head of the household is the divisive factor. Within the lower-income node, households of which head of household is under 45, percentage of jewelry buying households is 4.37%. The same figures are 3.58%, and 1.56% for households with head of household aged between 45 and 59, and older than 60, respectively. These results indicate that the probability of jewelry purchase is negatively related to the age of the household. In lower-income, and age below 45 node, the next divisive factor is the gender of the head of the household.

The jewelry purchase percentage is 6.82 in the node where gender is female, whereas it is 4% in the node where gender is male. According to this information, the head of household's age below 45 and head of household is female has a higher probability to purchase jewelry compared to their male counterparts. When the head of household age is between 45 and 49 under lower income node, the presence of individual(s) aged 6 to 18 becomes the next divisive factor. In households where 6-18 aged individual(s) do not exist, jewelry purchase percentage is 2.81, whereas the same figure is 4.38% where individual(s) aged 6-18 are present in the household. Therefore, lower-income households with a head of household aged between 45-49, and 6-18 aged individual(s) present are more likely to purchase jewelry than their counterparts. In the node where the income level is low, and the head of household is aged 60 or above, the presence of individual(s) aged 6-18 becomes the divisive factor. In households where individual(s) aged 6-18 do not exist, jewelry purchasing households are 1.28%, 4.73% where there is one individual aged 6-18, and 2.60% with households with more than one individual(s) aged 6-18. In low-income households where the head of the household's age is 60 or above, and there is one individual aged between 6 and 18, is more likely to purchase jewelry compared to its counterparts. This particular pattern shows irregularity with its unique characteristics.
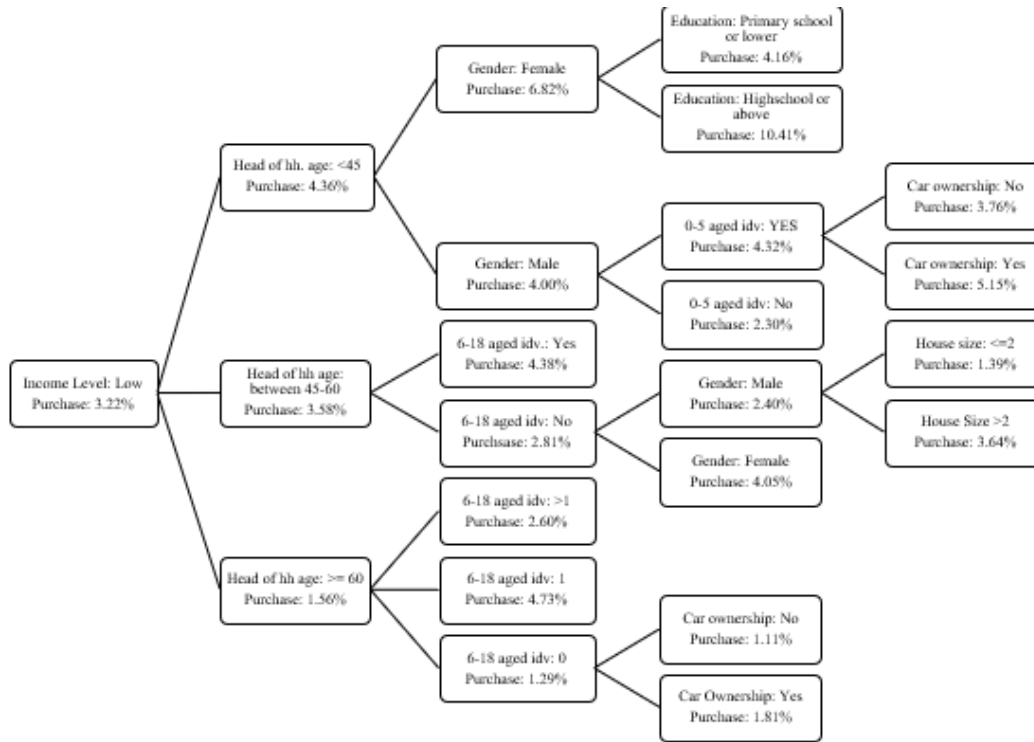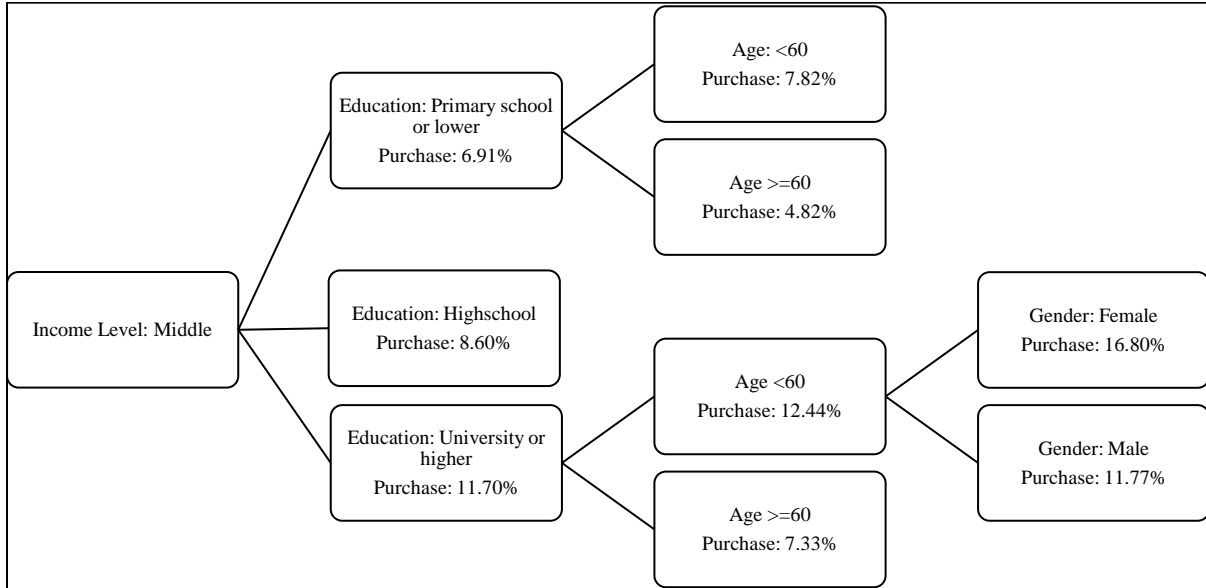
Figure 2: Lower Income Level Sub Tree

Figure 3: Middle Income Level Sub-Tree

Subtree under the middle-income level is shown in figure 3. The educational level appears to be the divisive variable for the middle-income level. Jewelry purchase percentages are observed to be 6.91 for primary school or lower educated head of households, 8.60 for the head of households with high school degree, and 11.7 for the head of households with a university degree or higher. It is seen that educational level positively affects jewelry purchase in the middle-income level. There were no sub-branches observed for the head of households with high school degrees, under the middle-income node. Divisive variable for primary school or lower educated household heads was found out to be head of household age. In node where the

head of household is under 60 years old, jewelry purchasing household percentage is 7.82 whereas household age above 60 showed a 4.82% jewelry purchase level. According to this information, it can be concluded that the age of the head of household negatively influenced jewelry purchase behavior. In middle-income households with the household head's education level being a university or higher, the divisive variable was observed as the age of the head of household. The node under middle income and head of household educational level is university or a higher degree, in households where the head of household's age is below 60, jewelry purchasing households are found to be 11.44%, whereas the same figure is observed as 7.33% for households with their heads aged 60 years old or higher. This information suggests that the head of the household's age has a negative influence on jewelry purchases.

The higher income level node did not have any sub-branches, and it can be concluded that the variables used in this study do not form any sub-branches in higher-income households.

5. Discussion And Suggestions

This study does not only represent the first of its kind in terms of studying a general market for jewelry consumption, and is unique for the methods used, it also presents a set of insights that could be useful for professionals and scholars. With only about 5% of the population purchasing jewelry, it is essential to find out who can be the potential buyers, and who are more likely to purchase jewelry. One of the first important findings is that the level of income is the primary factor in dividing the population based on their jewelry purchase behavior. Although 16.5% of higher-income households purchase jewelry, which dwarfs the other income levels' jewelry purchase percentages, it is important to keep in mind that higher-income households make up only 1.5% of the population. Ergo, even though middle- and lower-income level households have smaller jewelry purchasing percentages, they make up a greater percentage of the population, and therefore it is essential for marketers to find out who the potential buyers are. Table 2 shows that lower-income households make up more than 70% of the data, however, only 3.22% of them purchase jewelry. This information underlines the significance of finding out who those 3.22% could be.

For clarification purposes major findings in research are presented separately:

- Higher-income households are more likely to purchase jewelry (16.5%) but they make up a smaller portion of the total population (1.5%)
- Lower-income households are less likely to purchase jewelry (3.22%) but they make up 70% of the population.
- Figures suggest that even though lower-income households are less likely to purchase jewelry, they are the majority of both the society and jewelry purchasing households mathematically. Therefore, it is essential to find out who is the most likely group to buy jewelry in lower-income households.
- Most likely households to buy jewelry in lower-income households are the ones with house head is female, highly educated (bachelor's degree or above), and younger than 45.
- The least likely group to buy jewelry in lower-income households are the ones with house head is aged above 60 and does not own a car.
- Most likely households to buy jewelry in middle-income households are the ones with house head is female, highly educated, and younger than 60.
- The least likely group to buy jewelry in middle-income households are the ones with household heads with low education (primary school or none) over 60 years old.
- In the high-income group, no difference was observed between buyer and non-buyer households.

Results show that high-income households are equally likely and homogenous in terms of jewelry purchase behavior. On the other hand, marketers need to target households with the

household head who are female, highly educated, and relatively young to sell jewelry in middle and lower-income levels as they are more likely to purchase jewelry. Similarly, marketers should not target (even avoid or exclude) less educated households with house head over 60 and not highly educated when conducting marketing efforts for jewelry.

Results open discussion for both academic and marketing implications. Given that marketing efforts are usually costly in terms of time and money, the findings of this study may help marketers target their potential customers faster and easier with higher success. Jewelry marketers could avoid being present (physically or by promotions) where less likely potential buyers are frequent, and they might increase their presence where more likely potential customers are located. For academics, there are areas this study fails to brighten. Although the question "who" is answered in this study, the motives of those who are more likely to purchase cannot be studied with the data at hand. Therefore, a further research on groups who are more likely to purchase jewelry to find out why and under what conditions they are more likely to purchase can be a good follow up research after this study.

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Characteristics Of Jewelry Purchasing Households: A Machine Learning Perspective

Mücevherat Satın Alan Hanelerin Özellikleri: Makine Öğrenmesi Perspektifi

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Genişletilmiş Özet

Arkeolojik bulgulara göre milattan önce 40.000'li yıllardan beri günümüz Türkiye topraklarında görülen mücevherlere ilgi günümüze kadar çeşitlenerek devam etmiştir. Tanım itibariyle mücevher bir lüks tüketim ürünü olmakla beraber Türkiye'de birikim, tasarruf, hediye gibi farklı sosyal ve kültürel nedenler için de satın alınabilmektedir. COVID-19 öncesi dönemde 2025 yılında dörtyüz seksen milyar dolara ulaşması beklenen mücevher endüstrisinde diğer pek çok alışveriş alanında olduğu gibi çevrimiçi alışverişlerin de arttığı ve mücevhere erişimin daha zahmetsiz hale geldiği, aynı zamanda çevrimiçi alışverişle birlikte giderek yaygınlaşacağı değerlendirilmektedir.

Yapılan literatür araştırmasında mücevher tüketimi ve pazarlaması alanındaki çalışmaların genel olarak hali hazırda mücevher satın alma niyetinde olan kişilerin satın alma nedenlerini belirleme üzerine yoğunlaştığını gözlemlemek mümkündür. Bunun dışında, bu çalışmadaki bulgularla uyumlu olarak literatürdeki çalışmalar mücevher satın alma davranışıyla harcanabilir gelirin pozitif, yaşın ise negatif korealasyon gösterdiği ortaya konmuştur. Türkiye'deki farklı kullanım ve satın alma amaçlarına rağmen mücevherat pazarlaması alanındaki yayın sayısının azlığı da dikkat çekmektedir. Bu çalışmada diğer çalışmalardan farklı olarak kişilerin mücevherat satın alma davranışının nedenleri değil, mücevherat satın alan hanelerin farklı gelir gruplarında satın almayan hanelerle arasındaki farklar incelenmek istenmiştir. Çalışmada TÜİK'ten alınan, 2017, 2018 ve 2019 yıllarını içeren hanehalkı harcama verileri kullanılarak yüksek, orta ve düşük olarak belirlenen gelir gruplarına ait hanelerin hangilerinin mücevher satın alma olasılıklarının daha yüksek olduğu belirlenmeye çalışılmıştır. Söz konusu veriler çalışmada eflasyondan arındırılarak kullanılmışlardır.

Çalışmada yöntem olarak iki aşamalı bir yöntem benimsenmiştir. Yazarların bilgisi dahilinde bu yöntemle mücevherat satın alma davranışı daha önce incelenmemiştir. İki aşamadan oluşan yöntemin ilk aşamasında kümeleme analizi kullanılarak ana kümeler belirlenmek istenmiştir. Doğru çalışan bir kümeleme analizinde kümeler içinde yüksek, kümeler arasında ise düşük benzerlik gözlemlenmesi beklenmektedir. Kümeleme analizleri doğası gereği önceden belirlenmiş sınıf etiketleri içermediği için bir gözetimsiz makine öğrenmesi metodu olarak düşünülmelidir. Çalışmada kullanılan hanehalkı verileri harcanabilir gelirlerine göre iki adımlı kümeleme analizine tabi tutulmuştur. Bulunan kümeler düşük, orta ve yüksek gelirli hane halkları olarak etiketlenmiş ve analizler bu çerçeveye oturtulmuştur. Yöntemin ikinci aşamasında ise sınıf etiketleriyle belirlenmiş olan kümeleri en küçük parçalarına kadar ayrıştırmaya yönelik olarak bir karar ağacı oluşturulmuştur. Yorumlamayı kolaylaştırmasından dolayı finans, pazarlama, mühendislik ve tıp alanlarında sıkça kullanılan karar ağaçları

çalışmada aynı küme içindeki öğelerin farklılıklarını en etkiliden daha az etkiliye doğru sıralamak için kullanılmıştır. ID3, CHAID, QUEST ve CAL5 gibi farklı algoritmalar arasında çalışmanın amacına en uygun olduğu düşünülen CHAID algoritmasının kullanılması uygun görülmüştür.

Çalışmada kullanılan CHAID analizi sonuçlarına göre hane geliri, hane reisinin eğitim düzeyi, hane reisinin yaşı, hane reisinin cinsiyeti, hanede 0-5 yaşları arasında birey bulunması, hanede 6-18 yaşları arasında birey bulunması ve hane reisinin araç sahipliği durumu mücevher tüketimi açısından anlamlı bulunurken hane reisinin medeni durumu, çalışma durumu, ev sahipliği ve yazlık sahipliği gibi özellikler ilgisiz bulunmuştur. Analizlerden edinilen bilgiler ayrı ayrı tablolar halinde paylaşılmış ve yorumlanmıştır. Çalışmada kullanılan verilere göre Türkiye'de hanelerin yaklaşık yüzde beş kadarı çalışılan yıllar arasında mücevher satın almıştır. Elde edilen sonuçlara göre mücevher satın alımı konusunda en önemli faktörün hanehalkı geliri olduğu belirlenmiştir. Çalışılan verilere göre düşük gelirli hanelerde mücevher satın alma oranı yaklaşık yüzde üçken orta gelirli hanelerde yaklaşık yüzde dokuz, yüksek gelire sahip hanelerde ise yüzde onaltı civarı olarak ölçülmüştür. Bu sonuçlar gelir yükseldikçe mücevher satın alma davranışının da arttığını göstermekte olup literatürdeki geçmiş çalışmalarla da uyumludur.

Çalışma sonucu ortaya çıkan alt kırılımlara bakıldığında farklı gelir grupları için farklı özelliklerin öncelik kazandıklarından söz etmek mümkündür. Örneğin, düşük gelirli hanelerde hane reisinin yaşının 45'ten küçük olduğu hanelerin %4.37 kadarının mücevher aldığı görülmüştür. Aynı oranlar hane reisinin 45 ile 59 yaşları arasında olduğu aileler için %3.58 iken 60 yaş ve üstü hane reisi olan aileler için %1.56 olarak bulunmuştur. Bu sonuçlar aile reisi yaşının mücevher alımı olasılığıyla ters ilişki içinde olduğunu göstermektedir. Düşük gelir grubunda 45 yaş altı aile reisi nodunun altındaki ayırıcı faktör cinsiyet olarak belirlenmiştir. Aile reisinin kadın olduğu hanelerde mücevher satın alma oranı yaklaşık yüzde yediyken, hane reisinin erkek oluduğu hanelerde ise yüzde dört kadardır. Bu bilgiye göre hane halkı resinin 45 yaşından küçük olduğu ailelerde kadın hane reislerinin olduğu hanelerin mücevher satın alma olasılıklarının daha yüksek olduğunu söylemek mümkündür. Hane halkı reisinin yaş aralığının 45 ile 49 arasında olduğu hanelerde ise sonraki ayırıcı faktörün hanede 6 ile 18 yaş arası bireyin varlığı olduğu belirlenmiştir. Hanede 6 ile 18 yaş arası bireyin bulunmadığı hanelerde mücevher satın alma oranı yüzde üçün altındayken hanede 6 ile 18 yaş aralığında birey bulunan hanelerde ise mücevher satın alma oranının yüzde dördün üzerinde olduğu belirlenmiştir. Düşük gelir grubuna ait hanelerin kırılım şeması beş kademeli bir yapıya sahipken orta gelir grubunda dört kademe gözlemlenmiş, üst gelir grubunda ise bir dallanmaya rastlanmamıştır. Bütün gelir grupları için kırılımları ayrı ayrı gösteren tablolara çalışma içerisinde ayrıca yer verilmiştir. Çalışmada öne çıkan sonuçlardan birinin yüksek gelire sahip hanelerde bir kırılımın görülmemiş olmasıdır. Bu bulgu yüksek gelire sahip hanelerin mücevher satın alma davranışının diğer gruplarda gözlemlenmeyen şekilde homojen olduğunu, yani yüksek gelir grubuna ait hanelerin hemen hemen hepsinin aynı oranda mücevher satın alma olasılıkları olduğunu göstermektedir.

Çalışma genel olarak değerlendirilecek olursa, kullanılan metot ve ortaya çıkan sonuçlar açısından bu çalışmanın özgün olduğu düşünülmektedir. Çalışma hem akademi hem de pazarlama çalışanları açısından kullanışlı veriler sunmaktadır. Hanelerin yalnızca yüzde beş kadarının mücevher satın aldığı hesaba katıldığında potansiyel satın alıcıları tespit etmek mücevher pazarlaması açısından yüksek önem taşımaktadır. Çalışma mücevher satın almada öncül faktörün gelir olduğunu, yüksek gelir grubunda bir dallanmanın görülmediği, diğer gelir gruplarında ise farklı özelliklerin farklı ölçülerde önemli olduğu ortaya çıkmıştır. Çalışmada kullanılan verilere göre her ne kadar yüksek gelir grubu %16'nın üzerinde bir oranla mücevher satın alıyor olsa da bu grubun toplam popülasyonun yalnızca %1.5'ini oluşturduğunun unutulmaması gerekir. Dolayısıyla, düşük ve orta gelirli haneler her ne kadar daha düşük oranda

mücevher satın alıyor olsalar da toplamdaki satın alım miktarları yüksek gelir grubundan daha fazla bir miktara karşılık gelmektedir. Düşük gelirli hanelerin veri setinin yüzde yetmişini oluşturduğu, ancak bu hanelerin yalnızca yüzde üçünün mücevher satın aldığı hesaba katılırsa bu yüzde üçün kim olduklarının tespitinin özellikle mücevherlerin doğru kişilere pazarlanabilmesi anlamındaki önemi anlaşılacaktır.

Çalışmaların sonuçlarına göre yüksek gelirli hanelerde bir farklılık gözlemlenmese de, diğer gelir gruplarında mücevher satın alma olasılıkları daha yüksek olduğundan pazarlamacıların daha genç, daha eğitimli ve kadın hane reislerini hedef almaları gerektiği sonucu ortaya çıkmaktadır. Aynı şekilde pazarlama açısından hane reisinin 60 yaşının üzerinde ve daha az eğitimli olduğu hanelerde mücevher satın alma olasılığı diğer gruplara kıyasla daha düşük olduğundan pazarlama çabalarının bu gruba yönlendirilmesinin faydalı olmayacağı sonucuna ulaşılması mümkündür.

 Pazarlama çalışmalarının para ve zaman anlamında maliyetli olduğu düşünüldüğünde bu çalışmanın pazarlama faaliyetlerinde daha yüksek başarı oranını daha düşük kaynaklarla sağlamakta faydalı olabileceği düşünülmektedir. Pazarlama faaliyetlerinin potansiyel alıcıların daha yoğun olduğu fiziksel ve sanal ortamlara kaydırılması, satın alma olasılığı daha düşük olan grupların ise mümkün mertebe karşısına çıkmayarak pazarlama için ayrılan kısıtlı kaynakların korunması mümkün olabilir. Akademik açıdan bakıldığında ise her ne kadar çalışma özü itibariyle mücevher satın alma olasılığı yüksek olan hanelerin kimler olduğunu açıklasa da, kullanılan verinin doğası gereği satın alma motivasyonunun ne olabileceğinin ortaya konabilmesi mümkün değildir. Farklı gelir gruplarının mücevher satın alma olasılıklarının farklı olması ve satın alan kişilerin farklı özellikler göstermeleri ayı zamanda farklı gelir gruplarındaki kişilerin mücevher satın alma motivasyonlarının birbirlerinden farklı olabileceğini düşündürmektedir. Bu nedenle bu çalışmada tespit edilen gruplara uyan denekler üzerinde satın alma motivasyonunu ölçen devam çalışmaları düşünülebilir.