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From Cruisers to E-Bikes: A Market Segmentation Blueprint

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ABSTRACT

The study uses Correspondence Analysis (CA) to find out what people think about different kinds of two-wheelers. The study uses answers to questionnaires from 420 people in Coimbatore, India, to find out what kinds of motorcycles people like best: standard, sports, cruiser, electric, or off-road. It does this by figuring out how the performance, safety, cost, brand reputation, and environmental sustainability of these bikes are all connected. There are two main dimensions in the CA results: Dimension 1 (performance vs. rugged usefulness) and Dimension 2 (technology vs. traditional features). The results show that while sports and cruiser bikes are linked to speed, style, and brand reputation, off-road motorcycles are linked to safety and cutting-edge technology. People understand that while traditional bicycles are affordable and comfortable, electric bicycles are more environmentally friendly and incorporate new technology.

The study shows that CA has a clear and understandable approach to market positioning, effectively dividing its clientele into multiple groups. Future research should use bigger, multi-regional datasets and more precise prediction algorithms to mitigate problems such as sample bias and geographic constraints. This study clarifies human behavior and offers useful information for creating new products and identifying the right markets in the quickly changing two-wheeler industry..

Keywords: Correspondence Analysis, Consumer Preferences, Two-Wheelers, Market Segmentation, Brand Perception, Electric Bikes, Strategic Marketing.

1. INTRODUCTION:

The relationship between various bike types and client categories may be clearly explained by Correspondence Analysis (CA) diagrams. Bike types and their perceived attributes are mapped into a common two-dimensional framework to help marketers target specific customer demographics (Greenacre & Blasius, 2006; Hair et al., 2019; Malhotra & Dash, 2016). While choosing a two-wheeler, consumers consider a variety of factors, such as price, technology, safety, brand reputation, and environmental concerns (Ali & Gharpure, 2022; Joshi & Sharma, 2020). The increased demand for luxury motorcycles such as Harley Davidson, Kawasaki, and Royal Enfield in India can be ascribed to improved infrastructure, changing consumer preferences, and economic growth (Sharma & Bansal, 2023).

The CA diagram's two primary sections highlight the subjects that customers are most interested in. They appeal to people who enjoy riding off-road motorcycles because they are durable and have cutting-edge technology. Because of their speed, attractive appearance, strong brand equity, and significant market value, they are preferred by sports and cruise enthusiasts (Chandramouli & Kumari, 2021). Normal bikes, which are positioned in the center of the diagram, appeal to people looking for a dependable, affordable, and fuel-efficient bicycle due to their comfort, affordability, and fuel efficiency (Goyal & Joshi, 2020). Because of their perceived environmental benefits and technological advancements, tech-savvy and environmentally conscious consumers prefer electric bikes, which are located in the bottom-left quadrant (Sharma & Bansal, 2023).

This study makes it easier to target specific groups of customers with marketing by grouping them based on how

well the product fits their needs. Marketers and producers can better meet the needs and wants of each group if they know what these groups are. This will make customers happier and give them an edge in a market that is always changing (Kotler et al., 2021). In the competitive two-wheeler industry, this method shows how important it is to match a product's features with the values of its target market in order to get a lot of people to buy it.

Need for the Study

Understanding how buyers associate particular bike models with particular features is more important than ever as the two-wheeler market in India expands. These days, researchers frequently overlook perceptual mapping techniques that give us a wealth of diverse data, such as CA. In order to fill this gap, the survey examines how people's perceptions of motorcycles in the Standard, Sports, Cruiser, Electric, and Off-Road categories align with reality.

Statement of the Problem

The Indian two-wheeler industry has many sectors, each with distinct client expectations. Despite their quick development and expansion, businesses do not fully understand how customers view various bike models on a functional and psychological level. This restricts the ability to precisely target and position objects. To identify the perceptual connections that close the gap between customer expectations and marketing initiatives, the researchers employ correspondence analysis.

Objectives of the Study

- To investigate consumer preferences and perceptions toward various two-wheeler types.
- To identify perceptual groupings based on consumer-attributed features using **Correspondence Analysis (CA)**.
- To generate visual insights that aid in consumer segmentation and marketing strategies.

2. REVIEW OF LITERATURE

An extensive body of literature on consumer preferences toward two-wheelers highlights the multifaceted factors influencing purchase decisions. These include functional features, psychological and social cues, brand-driven appeal, and emerging market trends. This review provides a contextual foundation for interpreting the Correspondence Analysis (CA) diagram, which maps consumer perceptions across various bike categories.

Table 1: Thematic Summary of Key Literature Supporting Correspondence Analysis (CA) Dimensions in Two-Wheeler Market Segmentation

Focus Area	Key Findings	Authors & Year	Implications for CA Diagram
Functional Attributes	Consumers prioritize luggage space (18%), fuel efficiency (16%), pickup (10%), and comfort. Resale value also noted.	Patel & Sharma (2024)	Standard bikes linked to affordability and fuel efficiency.
	Price (16%), fuel efficiency (11%), product quality (9%), and comfort (6%) drive buyer decisions. Brand and service improve satisfaction.	Muniganti (2017)	Confirms value-conscious perception of Standard bikes.
	73% of buyers in Chennai prefer comfort, yet fuel efficiency remains crucial.	Praveen et al. (2024)	Supports Standard bikes as commuter-friendly choices.
Brand, Design, Performance	Major brands influence loyalty; performance and aesthetics matter for premium segments (e.g., Royal Enfield, TVS).	Kumar & Narayan (2019)	Sports & Cruiser bikes linked to brand prestige and styling.
	High-end buyers prioritize brand symbolism and feature sets.	Ali & Gharpure (2022)	Confirms aspirational branding in Sports & Cruiser categories.
Safety & Technological Features	Rugged design and safety features valued by Off-Road bike users.	Patel & Sharma (2024)	Off-Road bikes mapped to safety, adventure, and durability.
	Electric bikes perceived as futuristic and eco-friendly; consumers show interest in	Menon & Nair (2023)	Electric bikes positioned on

Focus Area	Key Findings	Authors & Year	Implications for CA Diagram
	green tech and battery advancements.		affordability–innovation axis.
	Safety Instrumented Systems (SIS) applicable to two-wheeler platforms.	Lee and Huang (2021)	Reinforcing the safety positioning of off-road bikes.
Psychological & Social Factors	Peer and cultural factors influence choices; gender-specific designs like TVS Scooty preferred for ease and style.	Sharma & Gupta (2023); Ahmed et al. (2020)	CA diagram reflects aesthetic and convenience-based preferences.
	81.8% use two-wheelers for daily commuting. Income not always a significant factor.	Kumar & Narayan (2019); Ahmed et al. (2020)	Indicates practicality dominates across demographics.
Market Trends & Segmentation	India ranks second globally in two-wheeler production; monthly sales exceed 300,000.	Praveen et al. (2024)	Highlights competitive intensity and market diversity.
	Four consumer clusters: Off-Road, Sports/Cruiser, Standard, and Electric—each with distinct needs and values.	Ali & Gharpure (2022); Menon & Nair (2023)	Confirms strategic mapping via CA.
	Demonstrate the feasibility of integrating *flexible solar cells* into evs, underscoring environmental sustainability	Wang et al. (2022)	a key attribute linked to electric bikes in CA diagram.

3.RESEARCH METHODOLOGY

In order to investigate consumer preferences and perceptions of two-wheelers, this study employed correspondence analysis. The methodology included the development of hypotheses, research design, sample design, data collection techniques, and data analysis. In order to test hypotheses, correspondence analysis visualised two-dimensional perceptual relationships between variables.

The research design was descriptive in order to characterise consumer preferences, perceptions, and the connection between two-wheeler categories and features that consumers attribute to them. Over the course of 30 days, 420 Coimbatore businesses and residents were surveyed using a non-probability purposive sampling technique.

In April–May 2025, structured questionnaires were dispersed both in-person and through questionnaires at EV dealerships, multi-brand showrooms, petrol stations and public spaces. Secondary data came from government publications, industry reports, and research articles.

Descriptive statistics, correlation analysis (CA), and two-dimensional plots (CA maps) were employed in SPSS to summarise the associations between bike type, consumer perceptions of attributes, and CA.

4.0 ANALYSIS AND INTERPRETATION

The study analyzes respondents' preferences for different bike types based on attributes to understand the relationship between bike types and consumer perceptions. Correspondence Analysis (CA) is used to interpret these associations and inform market positioning and targeting strategies. Results are presented visually and detailed through tables and figures.

4.1 Presentation of Table and Correspondence Analysis Diagram

A correspondence analysis output including a correspondence table, a summary table, and overview tables for both row (types of bike) and column (attributes) points, along with a correspondence map. I will interpret these to explain the relationships between bike types and attributes.

4.1.1 1. Correspondence Table:

The first table presents the raw frequencies of associations between 'types of bike' and 'Attributes'.

Table 2: Correspondence Table Showing Frequency Distribution Between Two-Wheeler Types and Consumer-Perceived Attributes

	Attributes										
Types of bike	**Price and**	**Brand reputation**	**Performance**	**Fuel efficiency**	**Design and**	**Comfort and**	**Resale value**	**Safety features**	**Availability of**	**technology and**	**Active Margin**

Standard	842	863	855	869	862	789	831	3040	842	828	10621
Sports	1407	1424	1389	1350	1377	1366	1357	1310	1446	348	12774
Cruiser	621	651	629	618	644	537	630	365	624	150	5469
Electric	170	183	149	163	148	157	145	256	113	99	1583
Off Road	119	129	114	116	126	110	108	6786	111	1988	9707
Active Margin	3159	3250	3136	3116	3157	2959	3071	11757	3136	3413	40154

The study reveals that sports bikes have high counts for most attributes, such as availability of spare parts, price and affordability, and brand reputation, while 'technology and features' is lower. Cruiser bikes have moderate counts, with'safety features' being lower. Electric bikes have lower counts, but 'safety features' is higher. Off-road bikes have high counts for safety features and technology and features.

4.1.2. Summary Table:

This table provides crucial information about the dimensions extracted by the correspondence analysis. The following hypotheses were tested:

- **H_0:** There is no significant association between bike type and the consumer's preferred attribute.
- **H_1:** There is a significant association between different bike types and the attributes perceived by consumers.

Table 3: Summary of Dimensional Contributions in Correspondence Analysis of Two-Wheeler Preferences

Dimension	Singular Value	Inertia	Chi Square	Sig.	Proportion of Inertia		Confidence Singular Value	
					Accounted for	Cumulative	Standard Deviation	Correlation 2
1	.647	.419			.997	.997	.004	-.004
2	.027	.001			.002	.999	.005	
3	.020	.000			.001	1.000		
4	.011	.000			.000	1.000		
Total		.420	16861.044	.000[a]	1.000	1.000		
a. 36 degrees of freedom								

The Correspondence Analysis output's "Summary" table shows a significant association between bike types and consumer-preferred attributes. The Chi-Square value is 16861.044, and the significance level is 0.000a, indicating that the observed association is not due to random chance. The null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) accepted. Two dimensions (Dimension 1 and Dimension 2) are most significant, with Dimension 1 accounting for 99.7% of the total inertia and Dimension 2 accounting for 0.2%. The two-dimensional solution, primarily Dimension 1, is effective in representing the data, accounting for 99.9% of the variance in the relationship. Thus, the observed relationships are not due to random chance.

4.1.5. Correspondence Map

The map visually represents the relationships inferred from the tables. Points that are close together in the map are associated.

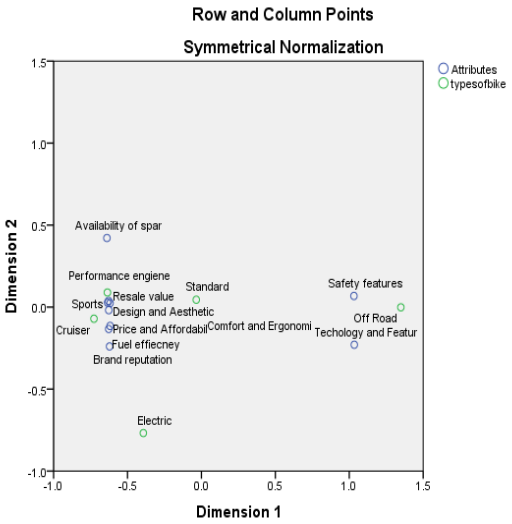

Figure 1: Correspondence Analysis of Bike Types Across Feature Dimensions

The analysis of bike types is divided into two dimensions: Horizontal Axis (Horizontal Axis) and Vertical Axis (Vertical Axis). Horizontal Axis primarily separates 'Off Road' bikes and 'SAfety features'/'techology and features' on the positive side, while Vertical Axis primarily separates 'Availability of spare parts' from 'Electric' bikes and 'technology and features' on the negative side.

Off-Road bikes are strongly associated with safety features and technology, with high counts in the correspondence table. Electric bikes are somewhat distinct, showing an association with the negative end of Dimension 2, suggesting a unique profile. Sports and Cruiser bikes are located near a cluster of attributes such as price and affordability, brand reputation, performance engine power, fuel efficiency, design and aesthetics, comfort and ergonomics, and sale value.

Standard bikes are positioned close to the center of the map, suggesting they represent a more general or balanced set of characteristics. 'Availability of spare parts' is distinct on Dimension 2, indicating it's an important differentiator, although its primary association with any specific bike type isn't immediately obvious from the map.

The correspondence analysis reveals clear associations between bike types and their perceived attributes. Off-Road bikes are strongly defined by safety features and technology and features, while Sports and Cruiser bikes share a profile aligned with general performance, affordability, and design characteristics. Electric bikes have a somewhat distinct profile, especially along Dimension 2. Standard bikes represent a more general set of attributes.

2. CONCLUSION:

The study uses Correspondence Analysis (CA) to examine the connections between different types of two-wheelers and their associated characteristics. It reveals that off-road motorcycles are popular with adventurous consumers due to their safety, toughness, and cutting-edge technology. Sports and cruiser motorcycles are linked to performance, brand reputation, design aesthetics, and resale value, while standard bikes are ideal for budget-conscious commuters. Electric bikes are linked to being environmentally friendly and new, attracting environmentally conscious buyers.

The study found that consumers prioritize performance and brand appeal for off-road bikes, while they prioritize rugged utility and safety for off-road bikes. Each style of bike has its own marketing and strategic ramifications, with off-road bikes focusing on safety, off-road competence, and technical supremacy, while sports and cruiser bikes emphasize brand reputation, speed, and appearance. Standard bikes should focus on their usefulness, reliability, and gas savings.

The study contributes to theory and practice by highlighting the importance of safety and technology for off-road bikes and design and performance for sports and cruiser bikes. However, it acknowledges flaws, such as its focus on Coimbatore, India, and the potential for purposive sampling to lead to sample bias. Long-term research is needed to track changing customer sentiments and the potential for combining CA with machine learning to develop more detailed groups and models.

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