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An empirical analysis of gendered pricing and consumer perception: Exploring the pink tax

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Abstract

This study investigates gender-based pricing disparities in the personal care market, focusing on deodorants and razors sold on two major e-commerce platforms: Amazon and Nykaa. Through price analysis using ANOVA, the study identifies significant platform-based price differences, particularly on Nykaa, but finds no consistent evidence of gender-based price discrimination within platforms. A consumer survey was conducted to examine awareness, attitudes, and behavioural responses toward gendered pricing. Cluster analysis revealed three distinct consumer segments based on pricing perception and purchase behaviour. Further, regression analysis showed that purchase Intention and consumer Attitude significantly predicted actual behaviour, while awareness and fairness perception did not. These findings indicate that consumer behaviour is governed more by underlying intent and resistance to marketing influences than by awareness alone. This study deepens the understanding of gender-based pricing in online personal care market and highlights the behavioural forces that shape how consumers respond to such disparities.

Key words: *Pink Tax, Gender-Based Price Discrimination, Consumer Behaviour, Price Fairness Perception, Amazon, Nykaa, E-commerce, ANOVA, Cluster Analysis*

I. Introduction

Gender-based price disparities in consumer products, often referred to as the "pink tax," has gathered greater attention in economic and sociocultural studies. The prase refers to the practice of charging higher prices for products marketed primarily to women compared to similar or even identical products marketed to men (Wishart et al., 2024). This problem is particularly apparent in the personal care sector, which included everyday essentials such as deodorants, razors, shampoos and skin care products (Pramesti, 2024). Although these products serve the same functional purposes, differences in packaging, marketing strategies, and ingrained societal norms often lead to higher prices for products targeted at women (Duesterhaus, 2011).

Recent research and social media campaigns like **#Ax The Pink Tax** have heightened public consciousness of the inequitable financial strain these pricing discrepancies impose on female consumers. Advocacy organisations contented that the Pink Tax not only increases women's expenses but also reinforces gender-based stereotypes. International consumer rights organisations have been pushing for legal reforms that would prohibit businesses from charging higher prices for identical products based solely on gender, with some countries, such as Sweden, introducing measures to investigate and address this issue (Kardetoft & Heshmati, 2022). Public indignation has prompted some companies to reassess their pricing strategies, with brands like Dove and Gillette making commitments to eliminate gender-based pricing in their product lines.

The increasing attention on the pink tax has raised questions about its implications for consumer behaviour, particularly in the domain of online purchasing. While most research on gendered pricing has primarily focused on traditional retail markets, the rapid growth of e-commerce platforms offers new insights into how gendered marketing influences price disparities in digital spaces. Online platforms such as Amazon and Nykaa provide contrasting environments for investigating these pricing practices. The distinct strategies between these platforms offer a unique opportunity to examine how gender-based price disparities manifest in online marketplace.

This study aims to examine gender-based price disparities in the personal care product market, with a focus on deodorants and razors. The study further incorporates findings from a consumer survey to capture how individuals respond to and interpret these differences.

A brief review of pink tax

The Pink Tax refers to the gender-based pricing phenomenon where products and services marketed toward women are often sold at higher prices than their male-oriented counterparts. Its development reflects not just economic patterns, but also sociocultural influences, and evolving policy debates. Early activism exposed disparities, while later research quantified their scale and linked them to deeper systemic inequalities.

The concept first gained prominence in the 1990s in the U.S., when advocacy groups revealed that women frequently paid more for personal care items like razors, deodorants, as well as for services like haircuts and dry cleaning, even when men's versions were nearly identical (Lafferty, 2019). This growing awareness led to legislative responses, most notably the Gender Tax Repeal Act, which directly addressed gender-based pricing discrimination (Pramesti, 2024).

In the early 2000s, academic work expanded the debate, situating the Pink Tax within broader economic and sociological frameworks. Scholars highlighted how societal norms and marketing strategies reinforced consumer behaviours that sustained price disparities (Lafferty, 2019). Studies revealed women also paid disproportionately more for services like haircuts and vehicle maintenance, reflecting broader gendered economic burdens (Duesterhaus, 2011).

By the mid-2010s, empirical studies systematically measured the Pink Tax, finding that women's products cost, on average, 7% more, with razors, shampoos, and deodorants showing the widest gaps (Wishart et al., 2024). Policy debates at the time also addressed menstrual products, often taxed as luxuries, prompting countries like Kenya, India, Canada, and Germany to abolish the "tampon tax" (Pramesti, 2024).

International research further revealed that these disparities vary across contexts, shaped by cultural norms and gendered marketing. Case studies from Indonesia and Sweden demonstrated how rigid gender roles in consumption patterns (Bernadette et al., 2022;

Kardetoft & Heshmati, 2022). Branding strategies were found to further inflated women's product prices despite only minor or negligible functional differences (Wishart et al., 2024). Recent studies have analysed Pink Tax drivers using large-scale consumer data. In the consumer-packaged goods (CPG) sector, findings have been mixed: women were often charged more for deodorants, whereas men sometimes paid higher prices for razors (Bhatia et al., 2021). Such evidence suggests that pricing gaps may be driven more by market segmentation strategies than by deliberate discrimination. (Vincent De Urquiza & Cooke, 2020).

Behavioural economic analyses point out that these disparities often arise from differentiation tactics and brand markups, rather than from explicit gender bias. (Barnes et al., 2022). While the Pink Tax traditionally highlights economic disadvantages faced by women, newer research reveal that men also face gendered pricing, the phenomenon referred to as the "Blue Tax." Men's skincare, haircare, and apparel are frequently priced higher due to branding tied to ideals of masculinity. (Xiong, 2024; Bhatia et al., 2021). This highlights that gendered pricing is a broader market phenomenon that affects women and men in different ways.

Research methods

A mixed-methods approach was employed. The first phase focused on a quantitative price analysis of 16 deodorants for each gender and 10 men's and 6 women's razors across Amazon and Nykaa. The second phase incorporated a consumer perception survey using a structured questionnaire supported by cluster analysis and regression analysis.

Price analysis

The study applied one-way ANOVA tests to examine pricing disparities in deodorants and razors across the two e-commerce platforms. These tests were designed to compare both product types across platforms and gendered variants within each platform.

Cluster analysis

To explore how consumers perceive and respond to gender-based pricing, cluster analysis was conducted using data collected from a structured survey (n = 142). The survey consisted of Likert-scale items covering behavioural, attitudinal, and ethical dimensions of consumer response to gendered pricing, including price awareness, product preference, fairness

perception, and openness to alternatives. Eleven variables were used for clustering, each representing a specific aspect of consumer behaviour—such as price responsiveness, brand loyalty, comfort with cross-gender purchasing, and support for gender-neutral pricing. The responses were analysed using a clustering algorithm (likely K-means), grouping respondents based on similar patterns of answers.

Regression analysis

To understand what drives consumer behaviour in response to gender-based pricing, a multiple linear regression analysis was conducted. It was aimed to determine which psychological and behavioural constructs could significantly predict whether a consumer would change their purchasing behaviour when faced with gendered pricing disparities.

The dependent variable was **Actual Behaviour**, representing real-life actions such as switching to cheaper, cross-gender, or gender-neutral alternatives. This was derived from survey items measuring frequency of such behaviour. The independent variables were five constructs identified through exploratory factor analysis, which are: Pink Tax Pricing (awareness and attentiveness), Price Sensitivity, Price Fairness Perception, Consumer Attitude (toward branding and advertising), and Purchase Intention (openness to gender-neutral or cross-gender products).

The general model was structured as follows:

$$Y=\beta_0+\beta_1 X_1+\beta_2 X_2+\beta_3 X_3+\beta_4 X_4+\beta_5 X_5+\varepsilon$$

Where,

Y = Actual Behaviour

X_1=Pink Tax Awareness

X_2 = Price Fairness Perception

X_3 = Attitude Toward Gendered Marketing

X_4 = Purchase Intention

X_5 = Price Sensitivity

ε = Error Terms

This analysis provided a foundation for interpreting behavioural responses in the context of awareness, fairness, and pricing logic, helping bridge the gap between consumer perceptions and real-world purchasing decisions.

Results

Gendered pricing patterns across E-commerce platforms

Descriptive statistics

The average price of men's deodorants on Amazon was ₹188.38 and ₹178.38 for women's. On Nykaa, averages were ₹223 for men and ₹221.44 for women. Women's deodorants showed higher standard deviation on both platforms, indicating greater price variability. For razors, Amazon's mean price was ₹171.3 for men and ₹235 for women, while on Nykaa it was ₹190.1 for men and ₹290.33 for women. Nykaa's women's razors had the widest range, from ₹98 to ₹645. Normality tests (Shapiro-Wilk) showed most groups met assumptions, except Nykaa women's deodorants (p=0.0151), suggesting deviation from normality.

Table 1:- Descriptive Statistics

Group	N	Mean	Median	Mode	SD	Min	Max	Skewness	Kurtosis	Normality (p)
Amazon Deo Men	16	188.38	192.5	143	33.91	143	245	0.07	-1.38	0.1841
Amazon Deo Women	16	178.38	161.5	156	51.7	112	307	1.03	0.48	0.0882
Nykaa Deo Men	16	223	215.5	177	41.45	169	299	0.45	-0.97	0.2603
Nykaa Deo Women	16	221.44	210	177	54.39	169	369	1.32	1.32	0.0151
Amazon Razor Men	10	171.3	166	80	52.56	80	243	-0.12	-0.96	0.7366
Amazon Razor Women	6	235	208	88	162.13	88	470	0.33	-1.48	0.1298
Nykaa Razor Men	10	190.1	181	89	52.57	89	278	-0.1	-0.04	0.7332
Nykaa Razor Women	6	290.33	237.5	98	228.44	98	645	0.49	-1.22	0.1245

Source: Author's calculation

Statistical analysis of pricing differences

Eight one-way ANOVA tests were conducted to examine price differences across platforms: Amazon and Nykaa, and gender-specific product lines, men's and women's deodorants and razors.

In the case of Cross Platform price differences,

The tests examined whether gendered products were priced differently across platforms. For men's deodorants, Amazon prices were significantly lower than Nykaa's ($F=6.689$, $p=0.015$). Women's deodorants showed a similar pattern, with Amazon again lower ($F=5.270$, $p=0.0029$). In contrast, no significant platform differences were found for men's razors ($F=0.640$, $p=0.434$) or women's razors ($F=0.230$, $p=0.639$).

While Gender-Based comparison showed that,

For Amazon deodorants, no significant price difference was found between men's and women's products ($F=0.420$, $p=0.523$). Similarly, Amazon razors showed no significant difference ($F=1.360$, $p=0.263$). On Nykaa, deodorants also showed no gender-based pricing gap ($F=0.010$, $p=0.928$). For Nykaa razors, the difference was again not significant ($F=1.850$, $p=0.196$).

Table 2:- ANOVA Results

Comparison	F-value	p-value	Significant
Amazon vs Nykaa – Deodorant (Men)	6.69	0.015	Yes
Amazon vs Nykaa – Deodorant (Women)	5.27	0.029	Yes
Amazon vs Nykaa – Razor (Men)	0.64	0.434	No
Amazon vs Nykaa – Razor (Women)	0.23	0.639	No
Men vs Women – Amazon (Deodorant)	0.42	0.523	No
Men vs Women – Amazon (Razor)	1.36	0.263	No
Men vs Women – Nykaa (Deodorant)	0.01	0.928	No
Men vs Women – Nykaa (Razor)	1.85	0.196	No

Source: Author's calculation

Consumer perceptions

The sample consisted of 142 respondents, with a higher representation of females (n=97) compared to males (n=45). In terms of educational attainment, most participants held a postgraduate degree (n=77), followed by undergraduate degrees (n=43) and high school qualifications or equivalent (n=22). With regard to employment status, 66 participants reported being unemployed. However, this category included homemakers, students without income, or retirees without income. 37 participants reported to be employed full-time, 25 were self-employed, 8 were retired with income and 6 were employed part-time.

Majority of the residents resided in urban areas (n=106), with smaller portions from semi-urban (n=28) and rural regions (n=8).

The mean age of participants was approximately 35.76 years.

Identification of Consumer Segments

The analysis identified three distinct consumer segments among 142 respondents. Each cluster represents a unique pattern of responses based on attitudes toward price sensitivity, brand loyalty, and openness to gender-neutral products.

Cluster Composition

- Cluster 1: Practical Egalitarians (n=43)

This group is highly engaged with pricing, often comparing gendered products and making purchase decisions largely based on cost. They prefer products marketed to their own gender but remain open to gender-neutral options, supporting fair pricing practices. Their willingness to purchase cross-gender products is moderate, reflecting practicality balanced with brand alignment. They are sceptical of design-based price differences and moderately believe gendered pricing impacts equality.

- Cluster 2: Gender Neutral Advocates (n=76)

This is the most equality-oriented and price-conscious group. Price strongly drives their purchase decisions, and they readily act on disparities. They are highly open to gender-neutral or cross-gender products, often preferring them over gendered alternatives. They

strongly reject price differences based on packaging or design, show little loyalty to own-gendered items, and score highest in ideological awareness, believing gendered pricing affects equality and supporting gender-neutral strategies.

- Cluster 3: Passive Brand Loyalists (n=23)

This cluster shows the least engagement with gender-based pricing. They rarely compare prices, and cost has little influence on their choices. They strongly prefer products marketed to their own gender and show low support for neutral options or gender-neutral pricing. Their willingness to buy cross-gender products is relatively high but likely stems from indifference rather than resistance to gendered pricing. They also show limited belief that pricing affects inequality, reflecting low ideological alignment with fairness concerns.

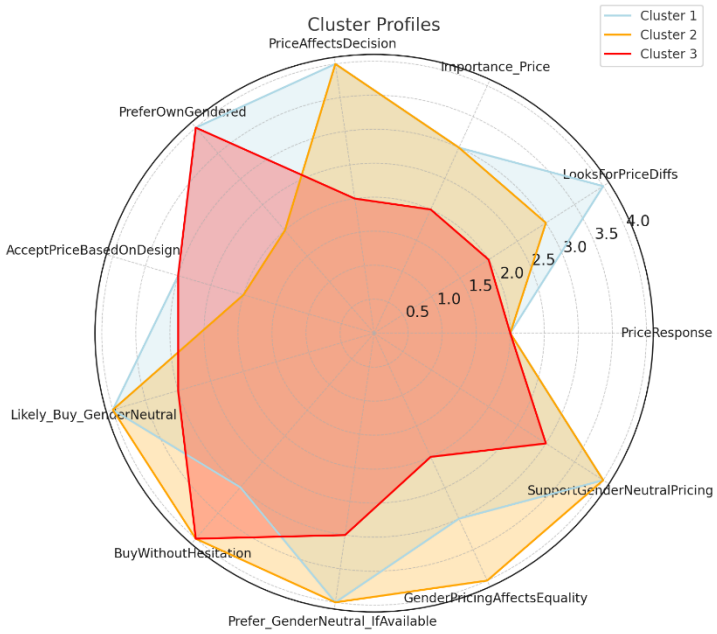
Table 3:- Final Cluster Centres for Consumer Segments

Variable	Cluster 1	Cluster 2	Cluster 3
Price Response	2	2	2
Looks For Price Diffs	4	3	2
Importance Price	3	3	2
Price Affects Decision	4	4	2
Prefer Own Gendered	4	2	4
Accept Price Based On Design	3	2	3
Likely_Buy_GenderNeutral	4	4	3
Buy Without Hesitation	3	4	4
Prefer_GenderNeutral_IfAvailable	4	4	3
GenderPricingAffectsEquality	3	4	2
Support Gender Neutral Pricing	4	4	3

Source: Author's Calculation

According to the ANOVA results presented in the annexure, all clustering variables differed significantly across the three segments ($p<0.05$), confirming that the clusters are statistically distinct.

Figure 1:- Radar Plot of Cluster Profiles



Source: Developed by author based on cluster analysis of primary survey data

As seen in Figure 1, Cluster 2 scores highest across most dimensions, indicating stronger support for gender-neutral pricing and fairness. Cluster 1 shows moderate engagement, while Cluster 3 reflects lower sensitivity to price and fairness, with a stronger preference for gendered products.

Construct Derivation

Exploratory Factor Analysis was conducted to reduce the number of observed variables and group related survey items into meaningful constructs. A total of six factors were extracted using principal component analysis with eigenvalues greater than 1. Each factor explained a substantial portion of the variance, with all exceeding the 50% threshold individually. The retained items demonstrated strong loadings, ranging from 0.69 to 0.84, confirming the internal consistency of the constructs.

The summary of these factors in presented as shown below:

Table 4:- Summary of Extracted Constructs

Factor	Survey Items Included	% Variance Explained
Pink Tax Pricing	A1, A2, A3, A4, A5	63.42%
Price Sensitivity	C2, C3, C4	53.41%
Price Fairness Perception	D1, D2	51.81%
Consumer Attitude	E1, E2, E3, E4	65.79%

Purchase Intention	F1, F2, F3	54.03%
Actual Behaviour	C1, G1	62.49%

Source: Author's Calculation

The six-validated constructs derived from the factor analysis were subsequently used as input variables in a multiple linear regression model to influence on consumer behaviour.

Drivers of Purchase Behaviour

A multiple linear regression was conducted to test whether five constructs – Pink Tax Pricing, Price Sensitivity, Price Fairness Perception, Consumer Attitude, and Purchase Intention – predicted Actual Behaviour. The model was significant, with $R=0.408$, $R^2=0.166$, and Adjusted $R^2=0.135$, showing that 16.6% of the variance in behaviour was explained. The regression was significant at $F=5.416$, $p<0.001$.

Purchase Intention emerged as the strongest predictor ($\beta=0.324$, $p<0.001$). Consumer Attitude also showed a significant positive effect ($\beta=0.193$, $p=0.022$), suggesting that consumers less influenced by gendered branding were more likely to alter their behaviour.

In contrast, Price Sensitivity, Price Fairness Perception, and Pink Tax Pricing Awareness did not significantly predict consumer behaviour in this model.

Table 5:- Regression Coefficients for predicting Actual Consumer Behaviour

Predictor	**β (Standardised)**	**t-value**	**p-value**	**Significance**
Price Sensitivity	-0.11	-1.261	0.21	Not Sig.
Price Fairness Perception	0.063	0.682	0.496	Not Sig.
Consumer Attitude	0.193	2.325	0.022	Sig.
Purchase Intention	0.324	3.664	< 0.001	Sig.
Pink Tax Pricing	-0.025	-0.3	0.764	Not Sig.

Source: Author's Calculation

Discussion

Price Disparities across platforms and gender

The ANOVA analysis revealed significant platform-based price disparities for deodorants, with both men's and women's variants costlier on Nykaa than Amazon. These results align with prior research showing that gender-focused platforms and premium branding often contribute to price inflation (Pramesti, 2024; Wishart et al., 2024). Nykaa's gendered

marketing and curated beauty-focused identity may intensify these disparities, even if they are not always directly tied to gender.

By contrast, no significant gender-based pricing differences were observed within either platform, challenging the assumption that the Pink Tax manifests uniformly across retail contexts. This diverges with earlier studies that consistently reported disparities in personal care products (Duesterhaus, 2011; Xiong, 2024). Instead, these findings suggest gender-based pricing is mediated by platform strategies and specific product categories (Bhatia et al., 2021).

The absence of within-platform disparities may be explained by deliberate product matching and sampling, which minimised the likelihood of extreme price variations. Intense competition on both Nykaa and Amazon likely constrains gendered differences as well. In Nykaa's case, higher prices may be better understood as part of its premium positioning rather than evidence of direct gendered pricing. These results may also reflect a gradual shift in the Indian market, where growing consumer awareness is encouraging more gender-neutral pricing certain categories.

Consumer segmentation and behavioural patterns

Cluster analysis revealed three distinct consumer segments, each reflecting different attitudes and behaviours toward gendered pricing.

Practical Egalitarians were price-conscious and moderately supportive of gender-neutral options, though they still preferred gendered products.

Gender-Neutral Advocates, the largest group, showed strong awareness of disparities and actively supported fairness-based choices, often selecting gender-neutral or cross-gender products.

Passive Brand Loyalists were least sensitive to pricing, strongly favouring gender-aligned products and accepting price differences justified by branding or design.

These findings align with prior research showing consumer responses range from active equity-driven choices to brand loyalty (Bernadette et al., 2022). Cluster 2 reflects studies where equity-oriented consumers adopt gender-neutral habits (Kardetoft & Heshmati, 2022).

Variation across clusters also mirrors evidence that design and branding shape fairness perceptions, producing uneven reactions (Vincent De Urquiza & Cooke, 2020).

The emergence of these segments may stem from differences in awareness, exposure, and personal relevance in the Indian market. Some respondents were influenced by education, urbanisation, or digital awareness, while others prioritised brand familiarity or aesthetics over fairness. Sample gender balance and cultural norms around roles and consumption may also have influences participant responses. This variation highlights how personal values, product perceptions, and habits intersect within an evolving consumer landscape.

Predictors of consumer behaviour

Regression results indicated that only Purchase Intention and Consumer Attitude significantly predicted Actual Behaviour. Respondents open to buy gender-neutral or cross-gender products, and those less influenced by gendered branding or advertising, were more inclined toward fairness-driven purchasing. This supports behavioural economic research suggesting that choices are guided more by intentionality and weaker brand attachment than by mere awareness or ethical beliefs (Barnes et al., 2022).

Conversely, Price Sensitivity, Pink Tax Awareness, and Perceived Fairness did not emerge as significant predictors. This points to an attitude–behaviour gap, where consumers support gender-neutral pricing in principle but rarely translate it into action—echoing findings from Bhatia et al. (2021) and Xiong (2024). Wishart et al. (2024) likewise argue that awareness alone, in absence of accessible alternatives and social reinforcement, is insufficient to trigger behavioural change.

The stronger predictive role of Purchase Intention and Consumer Attitude likely arise from their direct, action-oriented nature. Intention and attitude link more closely to behaviour than abstract notions of awareness or fairness perceptions. While many consumers recognise gendered pricing as unfair, only those motivated to act and less bound by branding appeared willing to change their purchase pattern. This suggests that mindset and motivation are more powerful drivers of behaviours than awareness alone.

Directions for future research and conclusion

Future research could expand on this study by analysing a broader range of product categories beyond deodorants and razors, including clothing, cosmetics, or services where gender-based pricing may be more pronounced. Including additional e-commerce platforms or physical retail stores would offer a more comprehensive view of pricing patterns across sales channels. A longitudinal approach could also help assess how pricing strategies and consumer attitudes evolve over time. Moreover, future studies could examine the psychological influence of packaging, colour, and design in shaping perceptions of gendered pricing, particularly how these visual elements affect how consumers judge a product's value. Comparative research could also investigate the emergence phenomenon of the Blue Tax, analysing whether and how men are charged more for certain products, and how this contrasts with the Pink Tax across different categories and cultural contexts.

This study explored gender-based pricing in personal care products and examined how consumers perceive and respond to such disparities. While platform-based price differences were observed, direct gender-based pricing within platforms was not significant. The findings show that people's actions are influenced more by their intentions and attitudes rather than just being aware of the issue. Encouraging informed and value-based choices could help move towards fairer pricing practices for all consumers.

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