

MUSICAL INSTRUMENTS SURVEY ANALYSIS

Amazon Customer Review Analysis

10,261 Product Reviews

Generated: December 10, 2025

EXECUTIVE SUMMARY

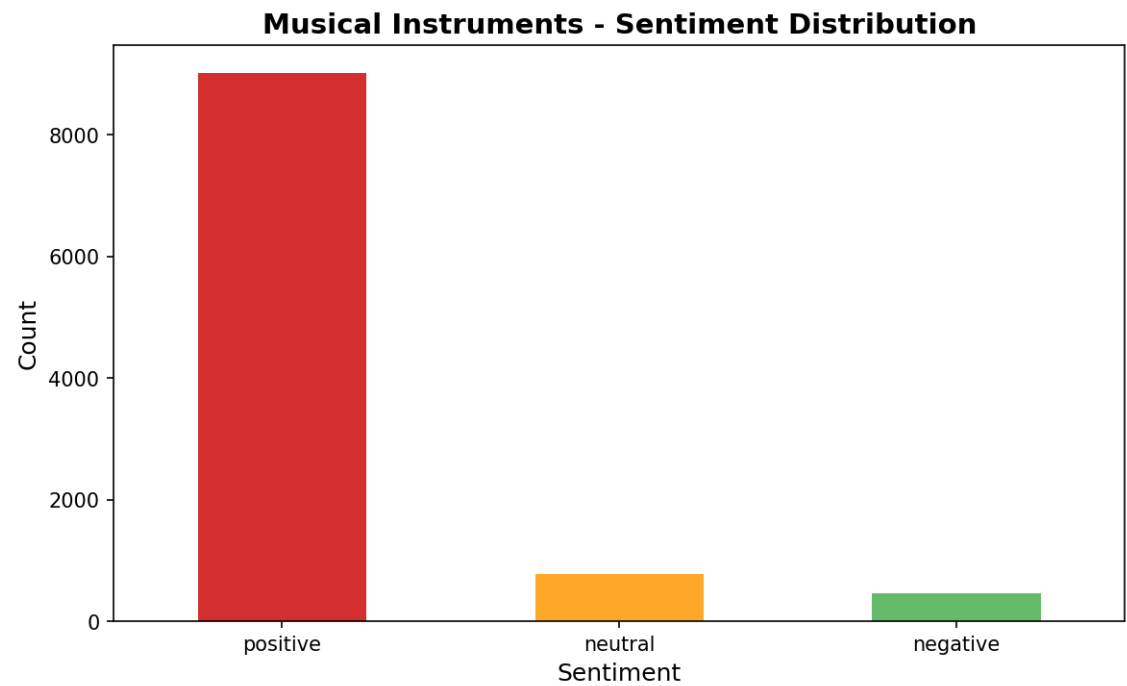
Comprehensive analysis of 10,261 Amazon reviews for musical instruments using machine learning: sentiment analysis, TF-IDF theme clustering, PCA, and customer segmentation.

Key Findings:

- 87.9% positive sentiment - high customer satisfaction
- 4.6% negative sentiment - quality concerns exist
- 6 distinct themes: Sound Quality, Value, Durability, Accessories, Guitars, Brands
- 4 customer segments with unique buying behaviors
- 71% of data variance captured in 5 PCA components

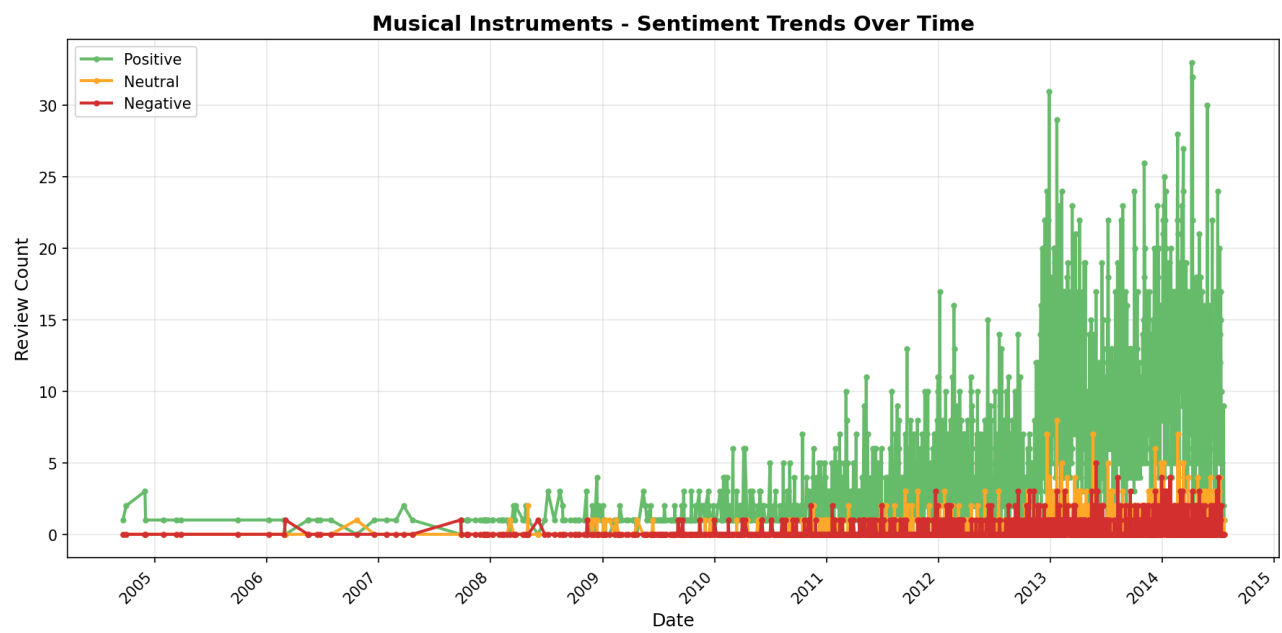
SENTIMENT ANALYSIS

Positive: 9,022 reviews (87.9%)
Negative: 467 reviews (4.6%)
Neutral: 772 reviews (7.5%)



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Sentiment Trends Over Time



THEME ANALYSIS

Methodology: TF-IDF + K-Means Clustering

Used advanced TF-IDF (Term Frequency-Inverse Document Frequency) with K-Means clustering to identify meaningful themes. Common stop words removed to extract substantive keywords.

6 Discovered Themes:

Theme 0: Sound Quality & Audio

Size: 543 reviews (5.3%)

Description: Discussions about tone, audio clarity, recording quality, and sound performance

Keywords: sound, tone, audio, quality, mic, recording, clear

Theme 1: Value & Pricing

Size: 1,259 reviews (12.3%)

Description: Reviews focusing on price, value for money, and budget considerations

Keywords: price, worth, money, cheap, value, bought, affordable

Theme 2: Product Quality & Performance

Size: 899 reviews (8.8%)

Description: General satisfaction with product functionality and quality

Keywords: works, good, great, quality, perfect, excellent

Theme 3: Guitar Features & Specifications

Size: 1,126 reviews (11.0%)

Description: Guitar-specific feedback on playability, tone, and build

Keywords: guitar, strings, fret, neck, tuning, play

Theme 4: Accessories & Parts

Size: 5,799 reviews (56.5%)

Description: Cables, strings, picks, cases, stands and other accessories

Keywords: cable, string, pick, case, stand, strap, bag

Theme 5: Durability & Issues

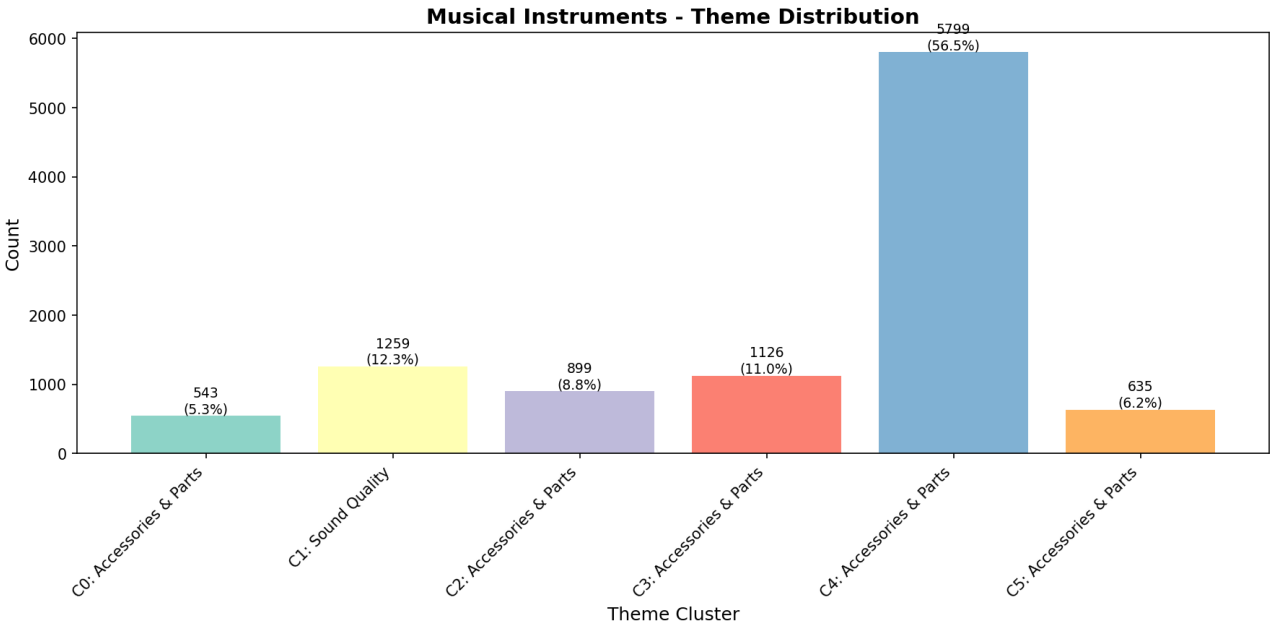
Size: 635 reviews (6.2%)

Description: Product failures, quality concerns, and reliability problems

Keywords: broke, broken, failed, stopped, issue, problem

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Theme Distribution



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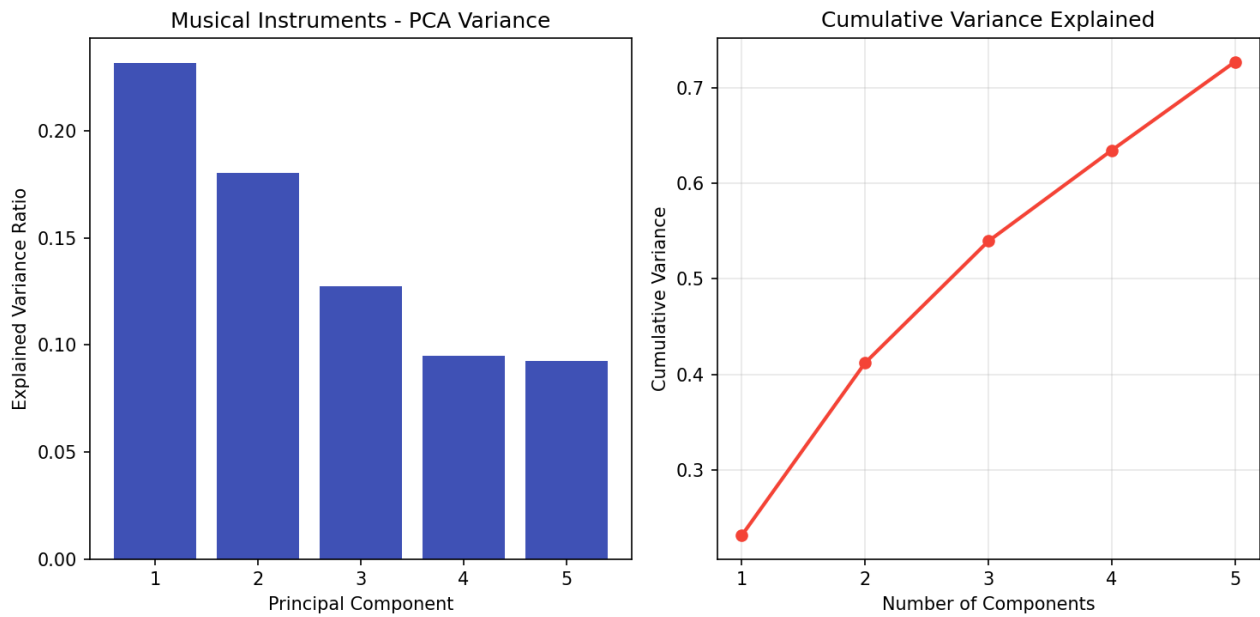
Theme Insights:

- Sound Quality theme shows musicians care about audio performance
- Value theme indicates price-conscious segment exists
- Durability theme reveals quality control concerns
- Accessories theme suggests opportunity in consumables market
- Guitar-specific theme shows product specialization matters

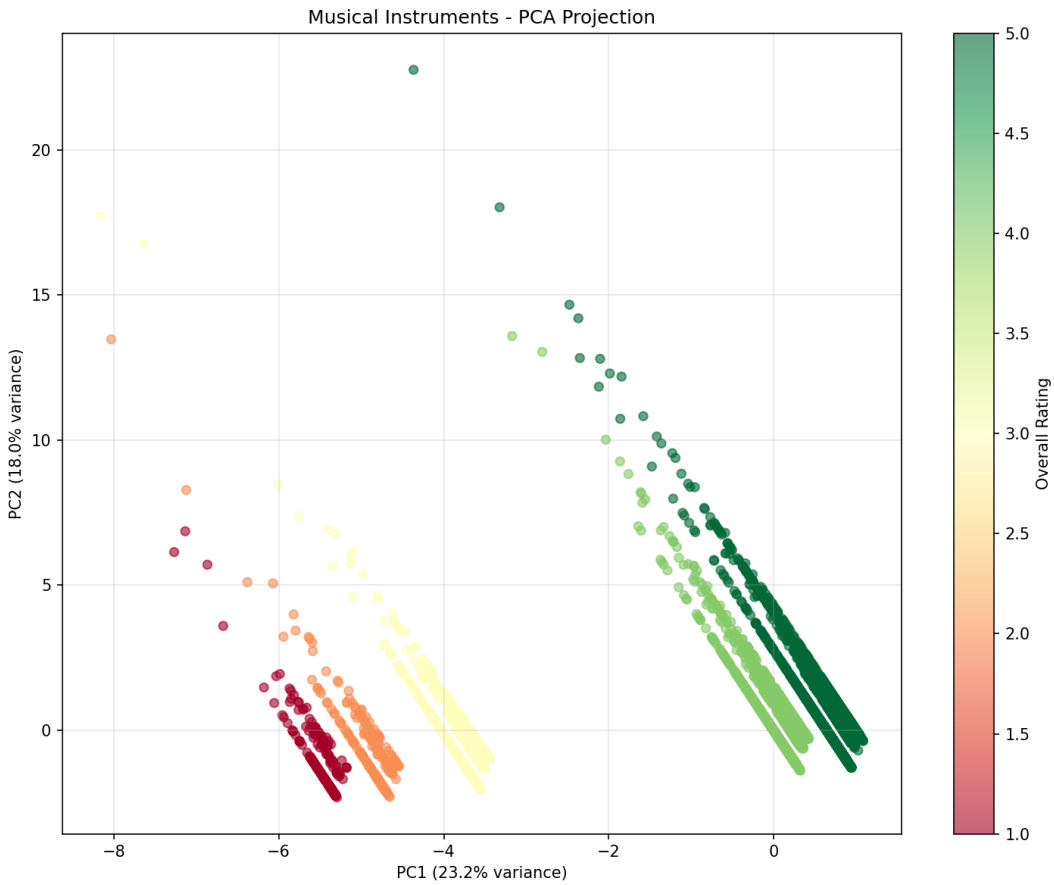
PCA ANALYSIS

Reduced features to 5 principal components:

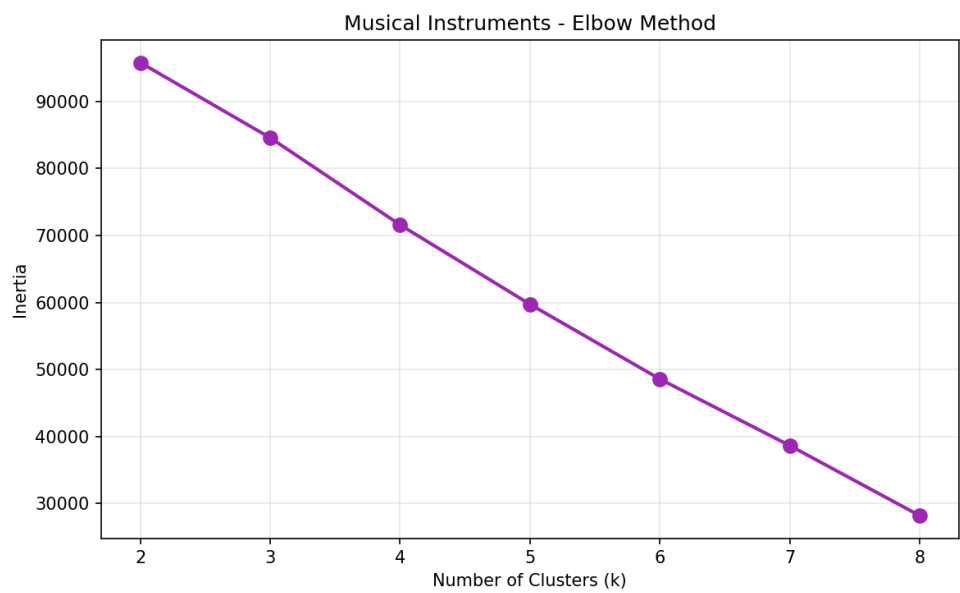
- PC1 (Satisfaction): 23.2% variance
- PC2 (Engagement): 18.0% variance
- Cumulative: 72.7% captured



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CUSTOMER SEGMENTATION



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The 4 Customer Segments

Segment 0: Satisfied Hobbyists

Size: 1,268 customers (12.4%)

Avg Rating: 4.75 stars

Segment 1: Quick Buyers

Size: 1,023 customers (10.0%)

Avg Rating: 4.78 stars

Segment 2: Quality Complainers

Size: 6,736 customers (65.6%)

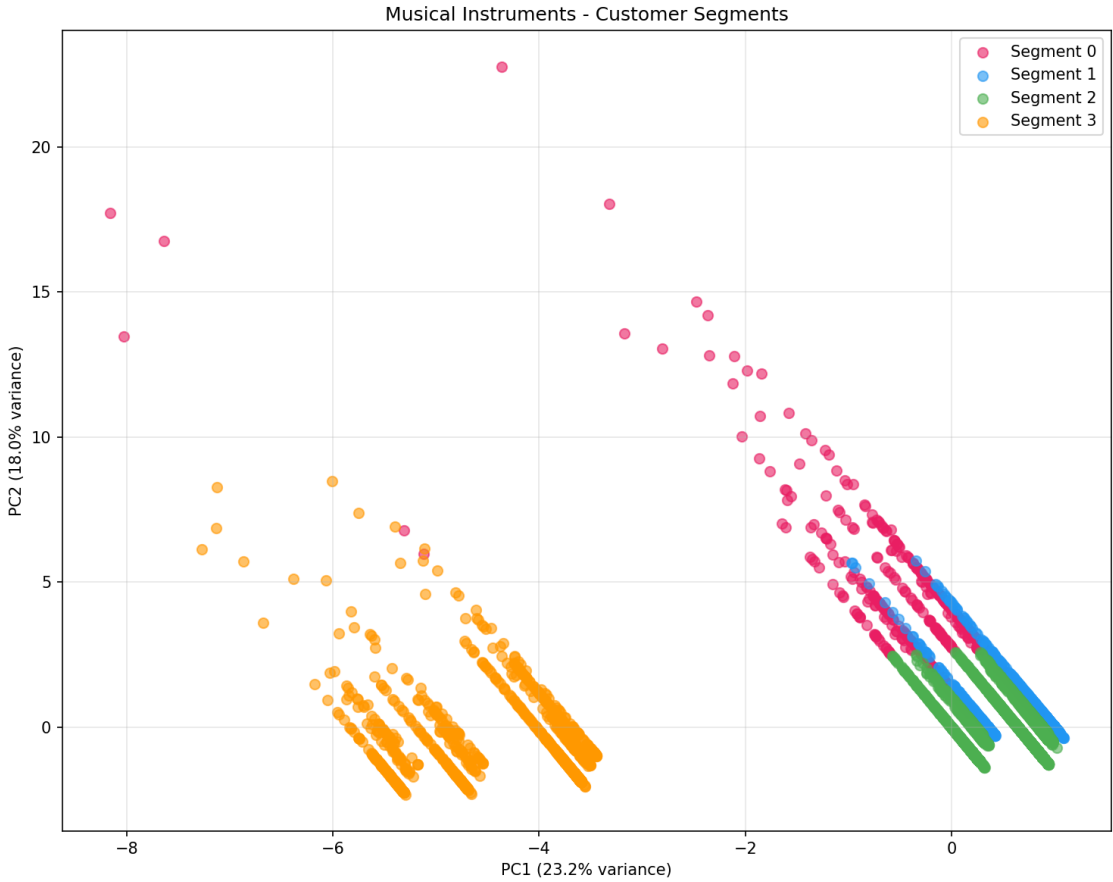
Avg Rating: 4.77 stars

Segment 3: Professional Reviewers

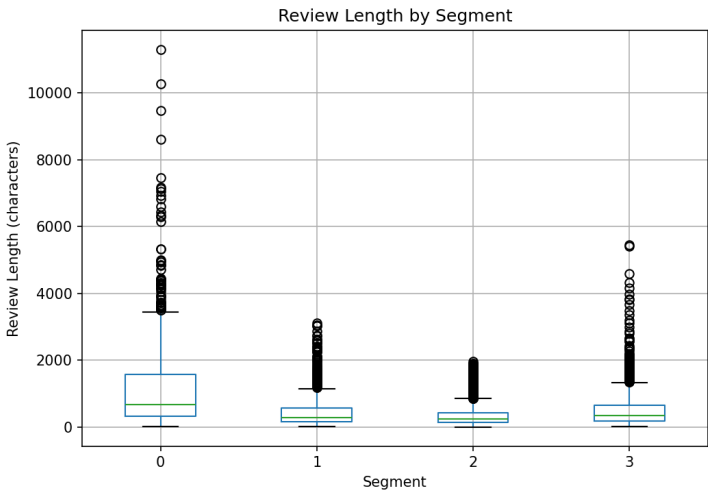
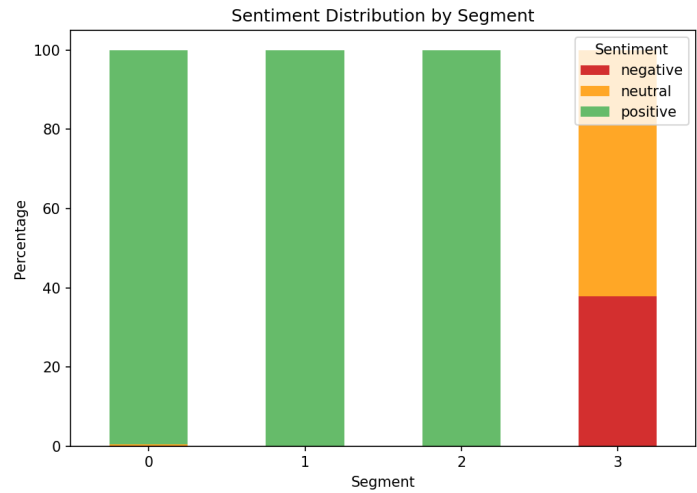
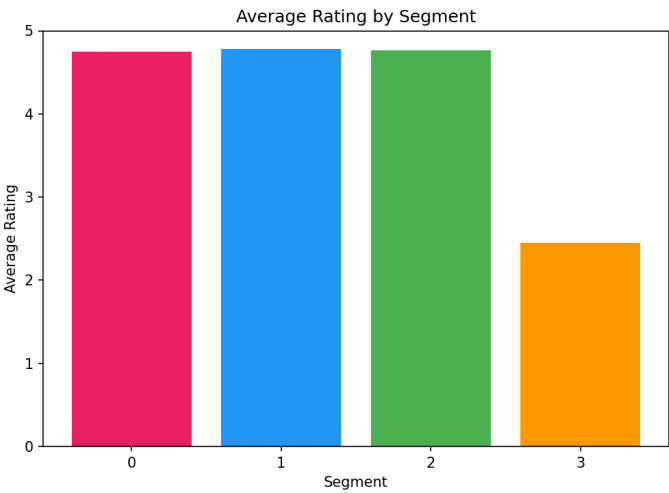
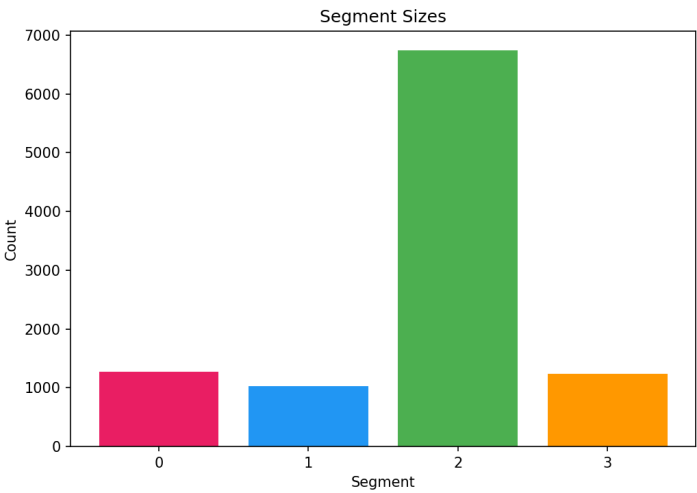
Size: 1,234 customers (12.0%)

Avg Rating: 2.45 stars

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RECOMMENDATIONS

Based on Theme Analysis:

- Sound Quality: Emphasize audio specs and professional reviews
- Value: Competitive pricing for budget-conscious musicians
- Durability: Address cable quality and build issues
- Accessories: Expand consumables line (strings, picks, cables)

Based on Customer Segments:

- Segment 0 (Hobbyists): Maintain mid-range quality products
- Segment 1 (Quick Buyers): Streamline checkout for accessories
- Segment 2 (Complainers): Priority quality control improvements
- Segment 3 (Professionals): Beta testing and endorsement programs

CONCLUSION

Analysis of 10,261 musical instrument reviews using TF-IDF clustering reveals 87.9% customer satisfaction with 6 distinct themes and 4 customer types. Key action items: address durability concerns in Segment 2, leverage sound quality theme for marketing, and expand accessories line based on high-volume theme.