Analysis of Ratings in Consumer Reports Database

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Summary

I explored the distribution of ratings across product categories. I looked at mainly two types of ratings: the rating criteria which range from 1-5 stars, and the overall score out of 100. The results show that there is significant variation in the distribution of ratings across categories.

The results show that while the categories with few products have very good rating coverage (almost all products are rated), the categories with several thousand products have a lower proportion of rated products but more rated products in total. The average overall score of a product varies from a high of 85% for money to a low of 61% for appliances. The variation in these averages might warrant some normalization before using this data in a recommendation system. I also computed the standard deviation in the average overall scores, since a low standard deviation would imply that the ratings might not be very useful for a recommendation system. However, results show that all categories have fairly large standard deviations, except for money and cars which have lower standard deviations. The rated criteria have uniform averages across all categories, with very uniform standard deviations as well. The significant quantity of ratings and their variation within each category should provide very useful information for a recommendation system.

Types of Ratings

1. Rating Criteria

Most products have multiple criteria rated from 1 to 5 (performance, durability, etc.)

Performance ★★★★☆

Durability ★★★☆☆

Usability ★★★★☆
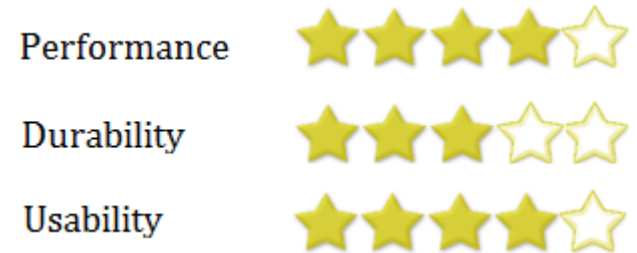
2. Overall Score

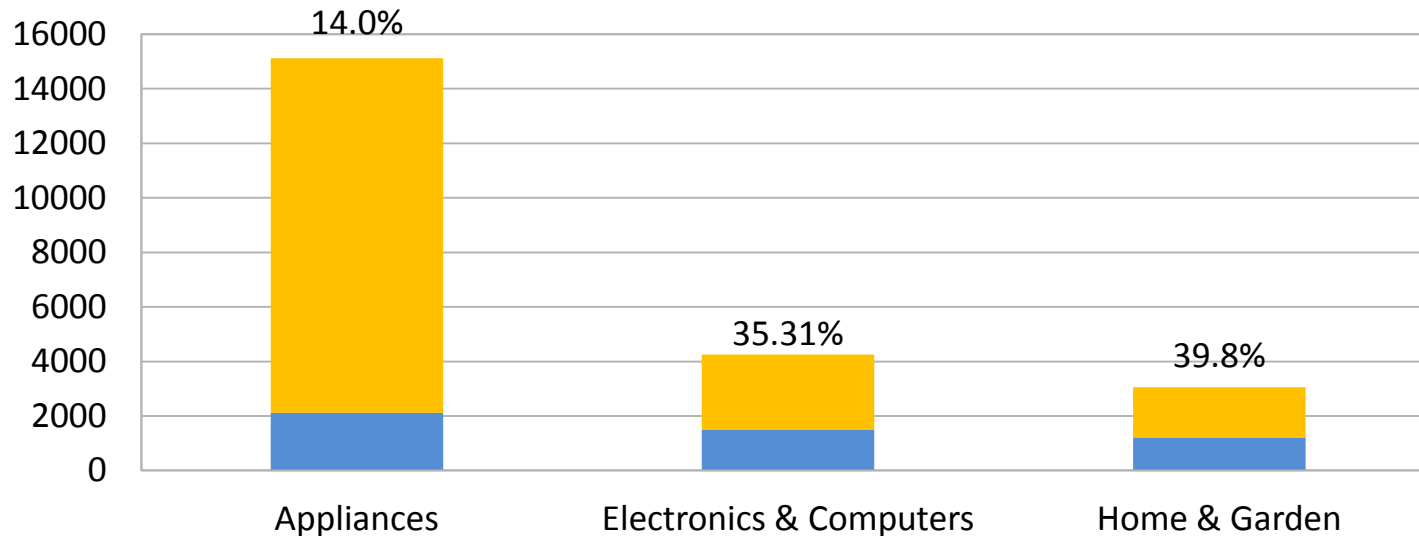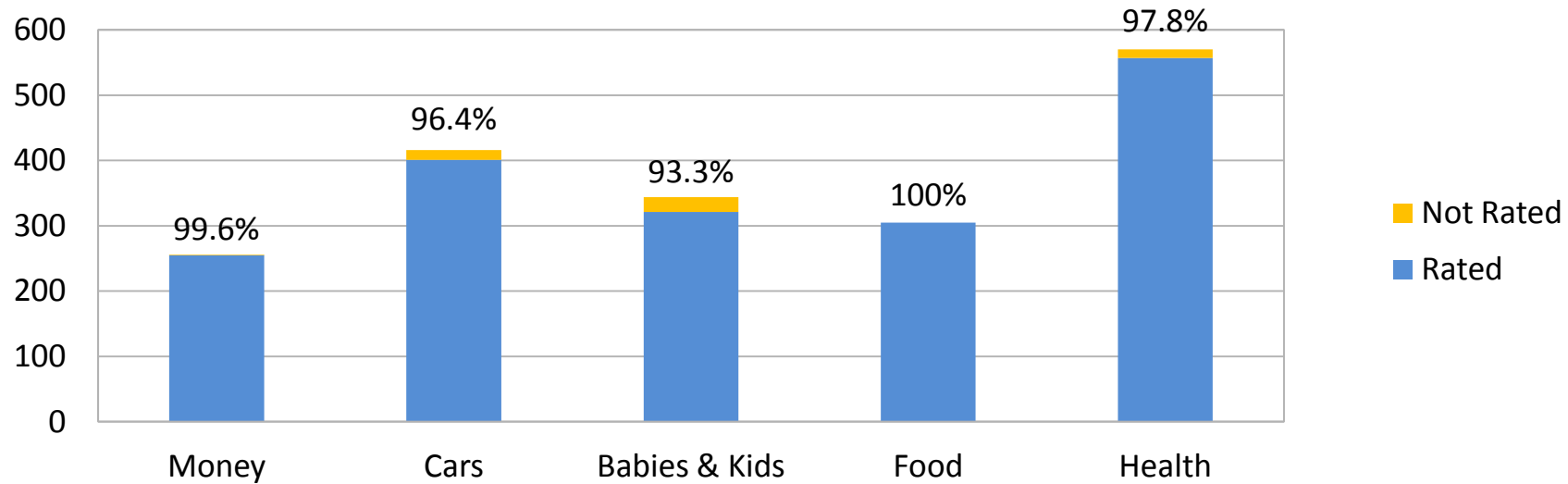All rated products have an "overall score" out of 100.

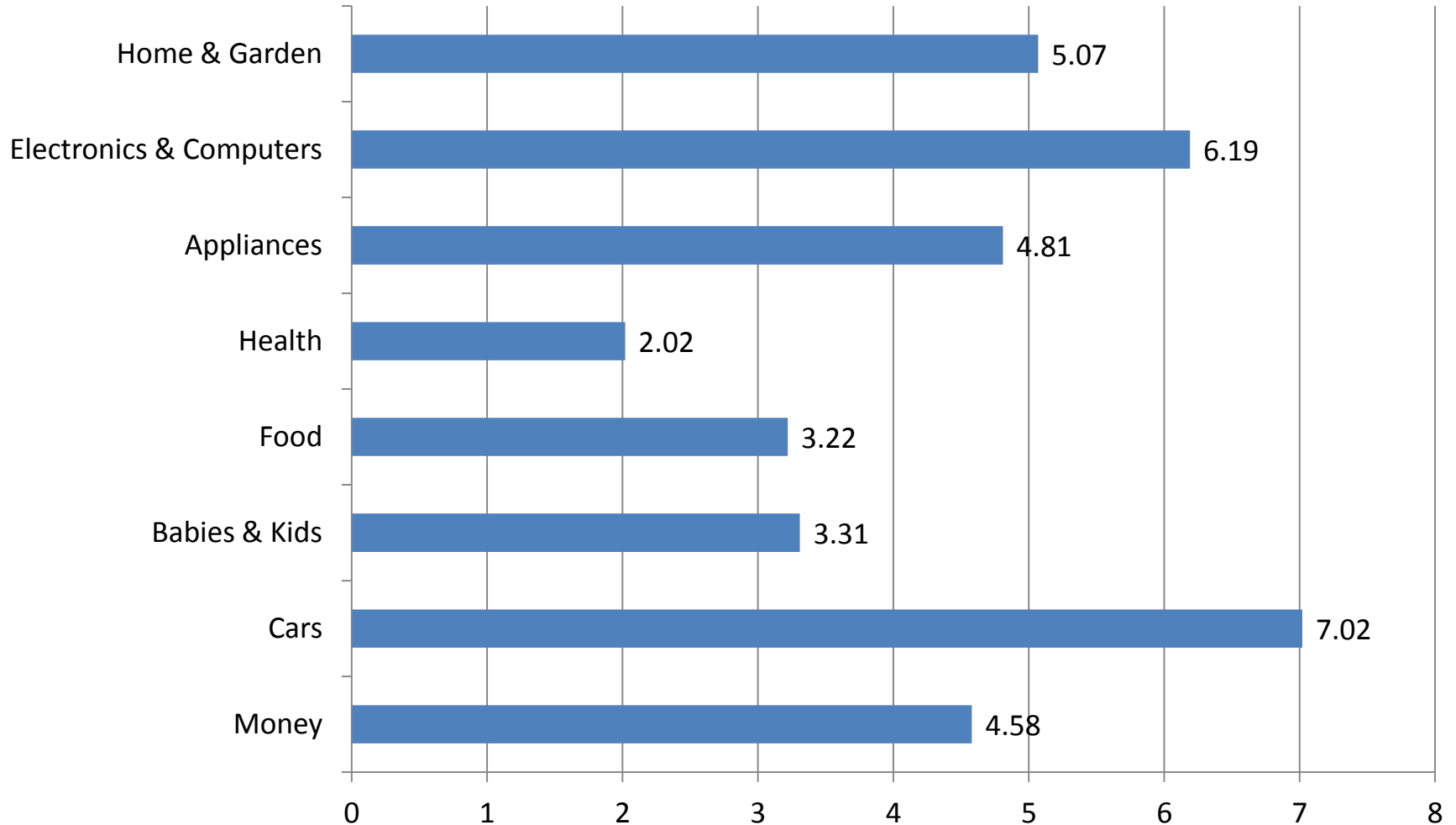Overall Score $\dfrac{75}{100}$

3. Other

Some products have unique ratings which can all use different scales.

ex: Price per serving ($)

(can be any real number)

Number of rated products by category

(Legend: Not Rated — yellow; Rated — blue)

Top chart — y-axis scale 0 to 600:
- Money: 99.6%
- Cars: 96.4%
- Babies & Kids: 93.3%
- Food: 100%
- Health: 97.8%

Bottom chart — y-axis scale 0 to 16000:
- Appliances: 14.0%
- Electronics & Computers: 35.31%
- Home & Garden: 39.8%

Average number of rated criteria by category

Category	Value
Home & Garden	5.07
Electronics & Computers	6.19
Appliances	4.81
Health	2.02
Food	3.22
Babies & Kids	3.31
Cars	7.02
Money	4.58

Average "overall score" of a product by category with standard deviation
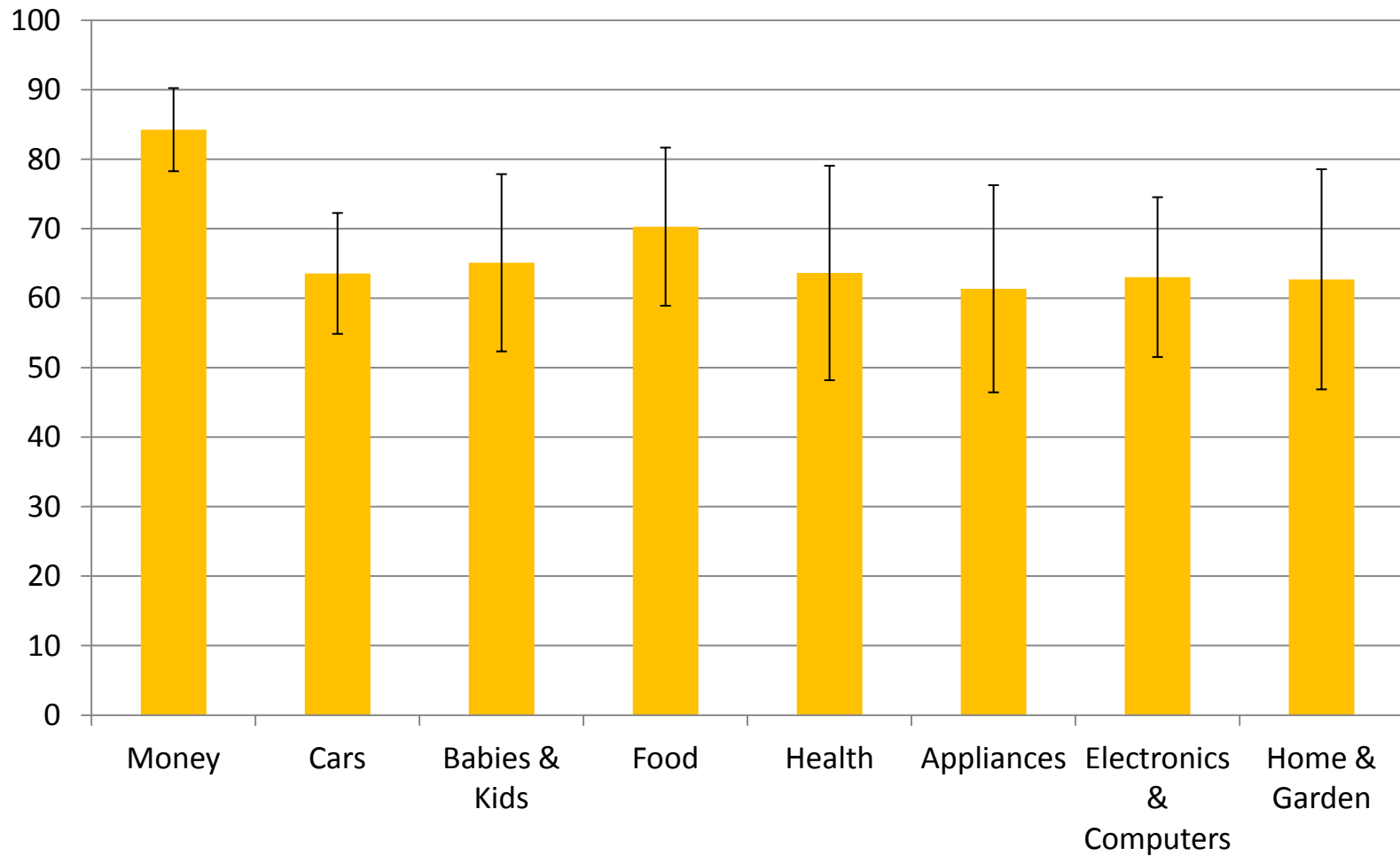
Average criteria ratings of products by category with standard deviation