Impact of Recommender Systems on Consumer Preferences:  
A Study of Anchoring Effects

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Recommendation systems have become prevalent decision aids in the electronic marketplace and an integral part of the business models of many firms. Such systems provide suggestions to the consumer as to products in which they may be interested and allow the firms to leverage the power of collaborative filtering and feature-based recommendations to better serve their customers and increase sales. Research in this context has focused almost exclusively on the development and improvement of the back-end algorithms that allow these systems to make accurate recommendations and predictions. It is well-established that information cues and context can significantly influence consumers’ preferences, interpretations, and ultimately the decisions they make. Despite large literatures in applied psychology, behavioral decision making, and marketing, very little research has explored how the cues provided by recommendation systems influence online consumer behavior. In practice, recommendations significantly impact the decision making process of many online consumers; if this were not the case, recommender systems would not be as prevalent as they are. In theory, they can influence the choice set, focus attention on specific products, aggregate consumer opinions, and act as a justifier for purchase decisions.

In most recommendation systems, consumers are asked to rate their liking of an item that they have experienced. This is often done after receiving a “system rating,” or some indication of an expectation of how much the consumer will like the item based on the recommendation system algorithm. The accuracy of the recommender system is then measured by a mathematical comparison between the suggested (system) ratings and the users’ actual ratings. We hypothesize that providing consumers with a prior rating generated by the recommendation system significantly influences their own rating in a way that artificially improves the resulting accuracy, providing a distorted view of the system’s performance. To test this hypothesis, we conduct controlled laboratory experiments to explore the impact of recommendations on consumers’ reported preferences.

As part of our study, a series of TV show experiments were conducted with 321 subjects. In all experiments subjects went through a series of display screens asking for judgments about television series. After this, subjects were shown a television show and were asked to rate it. In the first experiment, all users were shown the same TV episode. Varied from group to group, users were presented a manipulated “system rating” either before or after they actually experienced the episode. In the second experiment, users were shown different episodes along with a manipulated prediction score made by an actual real-time personalized recommender system. Our research found that users can be manipulated to rate toward the predictions given by the system. Specifically, we find strong evidence that a system-generated rating acts as a strong anchor for a consumer’s rating choice. This is found to be true in both directions, i.e., lower system-rating predictions, on average, result in lower actual consumer ratings and higher system ratings result in higher actual consumer ratings. Importantly, this result is also found to be independent of the accuracy of the system-generated predicted rating. In other words, even a
randomly chosen system-generated rating (i.e., not based on any recommendation system algorithm) has a significant impact on the consumer’s actual rating.

The results of this research provide strong evidence that the output of recommendation systems may likely be influencing the choices and ratings of consumers. This finding has several important implications. First, it suggests that standard performance metrics for recommendation systems may need to be rethought to account for these phenomena. In other words, it raises the question: If recommendations can influence consumer reported ratings, than how should recommendation systems be objectively evaluated? Second, it brings to light the potential impact of recommendation systems on consumer behavior and purchase decisions. If consumer choices are significantly influenced by recommendations, regardless of accuracy, then several potential issues with the application of recommendation systems arise such as a potential for unscrupulous business practices. In summary, we believe this study highlights the importance of conducting research that integrates ideas on behavioral decision making and recommender systems, both from practical and theoretical standpoints.