Thinking statistically about online customer reviews

Review counts and average ratings may mislead online shoppers

Stanford psychologist Derek Powell thinks online shoppers are making poor use of customer ratings. His research suggests shoppers prefer products with a greater number of reviews, even when average ratings are similar – and this bias may lead people to buy substandard goods.

In a study published in *Psychological Science* (bit.ly/2h8sf27), Powell and colleagues asked 138 adults to choose between pairs of cellphone cases with similar average ratings – based on Amazon's five-star scale – except that one of the products always had 125 more reviews than the other.

They found that participants, overall, preferred the case with more reviews, which is understandable if a product is highly rated: "In accord with the well-known law of large numbers, a score estimated from a greater number of reviews should be more reliable and give greater certainty about the quality of the product," wrote the researchers.

However, they observed that, "[i]n many conditions, participants actually expressed a reliable preference for more-reviewed products even when the larger sample of reviews served to statistically confirm that a poorly rated product was indeed poor".

But review counts are not the only problem. Star ratings may provide little in the way of meaningful information as any one point on the scale can mean different things to different people, "so we don't even have a consistent measure", says Liberty Vittert, a lecturer in statistics at the University of Glasgow.

Then there is the question of how an average score is calculated. According to a report by CNET (cnet.co/2hBocIP), Amazon previously took the mean of all customer ratings, but this changed in 2015 to give greater weight to newer reviews, reviews by verified customers, and reviews deemed helpful by other shoppers.

A weighted mean may be more informative than an unweighted mean, says Vittert. But in the absence of information on how the weighted mean is calculated, Vittert would prefer that the median was reported. "It's the more descriptive measure if nothing else is available," she says, "and is less sensitive to the extremes on either end of the scale." ■

Overcoming bias

Companies often complain that unhappy customers are more likely than happy ones to post online reviews, but researchers at Northwestern University suggest this can be countered by inviting a random sample of customers to share their experiences. A paper published in *Decision Support Systems* (bit.ly/2m8kHy7) finds that "star ratings of self-motivated reviews decrease over time, while the star ratings of retailer-prompted reviews remain constant".

Source: US Census Bureau

Gun law views linked to mass shootings

Research suggests those living near mass shootings are more likely to support stricter gun control

Analysis of public opinion surveys in the USA suggests that increased proximity to mass shootings is associated with heightened support for stricter gun control.

The research (bit.ly/2m7Gnup), by political scientists Benjamin Newman and Todd Hartman, was published online the day after a gunman shot and killed 58 people, wounding 546 others, at a Las Vegas music festival.

Using the 2010 Cooperative Congressional Election Study (CCES), a survey of 55 400 people, Newman and Hartman looked at the distance in miles between a respondent's zip code of residence and the location of the nearest mass shooting event in which three or more people were injured or killed.

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By comparing those closest to a mass shooting and those living furthest away, they found a 0.07 difference (or 20% increase) in the predicted probability of supporting stricter gun laws. The effect was replicated when analysing data from the 2010–2012 CCES re-contact panel, and the 2010 Pew Political Independents Survey.

Hartman, a statistical ambassador for the Royal Statistical Society, explains the results in more detail in a Q&A at significancemagazine.com/572. ■