

The Hong Kong Polytechnic University
Department of Logistics and Maritime Studies
Research Seminar

To Brush or Not to Brush: Product Rankings, Customer Search, and Fake Orders

by

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(Conducted in English)

Abstract:

“Brushing”---the practice of online merchants placing fake orders of their own products to artificially inflate sales on e-commerce platforms---has recently received widespread public attention. On the one hand, brushing enables merchants to boost their rankings in search results, because products with higher sales volume are often ranked higher. On the other hand, rankings matter because search frictions faced by customers narrow their attention to only the few products that show up at the top. Thus, fake orders from brushing may affect customer choice. We build a stylized model to understand merchants’ strategic brushing behavior and its welfare implications. We consider two competing merchants selling substitutable products (one of high quality, the other of low quality) in an evolutionary sales-based ranking system that assigns a higher ranking to a product with higher sales. In principle, such an adaptive system improves customer welfare relative to a case in which products are randomly ranked, but it also triggers brushing as an unintended consequence. Since the high-quality merchant receives a favorable bias in the sales-based ranking, he mainly has a defensive brushing incentive, whereas the low-quality merchant mostly has an offensive brushing incentive. As a result, brushing is a double-edged sword for customers. It may cause customer welfare to be even lower than what it would be in a random-ranking system, but in some other cases, it can surprisingly improve customer welfare. If brushing is more difficult for merchants (e.g., due to tougher regulations), it may make customers worse off as it attenuates brushing by the high-quality merchant but induces the low-quality one to brush more aggressively. If search is easier for customers (e.g., due to improved search technologies), it can actually hurt them as it may disproportionately discourage the high-quality merchant from brushing.

Bio:

Luyi Yang is an assistant professor of operations management and business analytics at Johns Hopkins University, Carey Business School. His research interests lie in consumer-driven service operations, business model innovation, applied mechanism design, digital marketplace, and operations-marketing interface. His research has been published in *Management Science* and recognized by several best paper awards. Luyi Yang holds a PhD in Operations Management and an MBA, both from the University of Chicago, Booth School of Business. He received dual bachelor's degrees in Industrial Engineering and English Language from Tsinghua University.

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All are welcome!