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Serial product evaluations online: A three-factor model of leadership, fluency and tedium during product search

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ABSTRACT

In any product search process, consumers encounter multiple products. In today's online retail environment, such product encounters are increasingly serial, such that consumers review products back-to-back (e.g., through swiping in mobile apps). The present research shows that for the serial evaluation of products, the serial position matters through an interaction of a leadership bias, conceptual fluency and tedium. During a product search, evaluations follow an S-shaped pattern consisting of (1) a primacy phase of declining evaluations (caused by a leadership bias towards the first product), (2) a wear-in phase of increasing evaluations (caused by increasing conceptual fluency after a recognition of the shared attributes of the product category), and (3) a wear-out period of declining evaluations (caused by tedium). Ten empirical investigations in an e-commerce setting granularly trace these three phases, establishing conceptually related overall boundary conditions (matching vs. searching products) and moderators (conditional vs. unconditional searching, product similarity, conceptual category knowledge, product image complexity) of the S-shaped pattern of serial product evaluations.

1. Introduction

When consumers search for a product online, they view on average a series of 124 different product pages before making a purchase (Huang, Lurie, & Mitra, 2009). In today's online retail environment, these search processes are increasingly serial (vs. hierarchical): consumers encounter a series of products of a category back-to-back, rather than iterating between presentation hierarchies (category overviews and product pages). Serial search processes are most common on mobile devices, whose limited display size forces many retailers to show their products as a series of individual items, through which consumers can scroll (e.g., Amazon) or swipe (e.g., fashion app Grabble). Some mobile shops even make a virtue out of serial review, implementing "Tinder features" that playfully encourage serial evaluation (e.g., Missguided, Mallzee). But also traditional websites offer serial navigation (e.g., Primark).

It is, therefore, highly relevant for retailers to know whether consumers' evaluation of serially encountered products changes over the position in the series. For example, retailers could position profitable products at "sweet" or avoid "sour spots" of evaluation. We are, therefore, interested in whether serial position effects arise during consumers' serial product search and which factors drive serial evaluation patterns.

This research extends the two-factor model of repeated exposure to similar stimuli (Zajonc, 1968), suggesting that three factors influence serial product evaluations online: First, a leadership bias towards the first evaluated product (Carlson, Meloy, & Russo,

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2006) lowers evaluations of the subsequent products in the series – a primacy phase arises. Second, conceptual fluency of the evaluations increases over the serial evaluation, as consumers progressively recognize the joint attributes and changing attribute levels of the category, which has a positive influence on evaluations and causes a wear-in phase. This extends the antecedents of exposure effects from perceptual (e.g., Landwehr, Golla, & Reber, 2017) to conceptual fluency. Third, feelings of boredom arise over an increasing number of serially reviewed products of the category – the tedium which lowers evaluations, causing a wear-out phase (Tellis, 1997). All three factors overlap, but dominate at different serial positions, such that evaluations result in an inverted S-shaped evaluation pattern.

But boundary conditions and moderators to primacy, wear-in and wear-out phase are implicit in the suggested drivers of the three phases. Generally, consumers need to be actually searching for a product, evaluating available options at each exposure to a new product, and not only matching options with a very narrowly defined target (e.g., a product replacement). Furthermore, moderators might alter one of the three phases: for instance, if consumers search conditionally (i.e., with some attribute levels defined and others open), the leadership effect during the primacy phase should be mitigated, as the leadership bias arises not for *all* but only for some attributes and fluency should arise earlier. Further, higher similarity between the products of the category or higher conceptual category knowledge of the consumer might enable an earlier conceptually fluent processing (wear-in phase). Finally, non-product related image complexity (e.g., of the product image, not the product) might delay perceptions of tedium and, thus, mitigate the wear-out phase. Our research will use these moderators to test the suggested three factors in a moderation of process design (Spencer, Zanna, & Fong, 2005).

In summary, we propose that the serial evaluations of products of a category during a product search follow a cubic shape: (1) a primacy phase (deteriorating evaluations) precedes (2) a wear-in (recovering evaluations) and (3) a wear-out period (deteriorating evaluations). Ten experiments in an e-commerce context support our proposition of an influence of serial position on product evaluations, which is altered through the theoretically related boundaries (matching vs. searching) and moderators (conditional searching, within-category similarity, conceptual category knowledge). The results of the studies are consistent over systematic variations of the device (mobile app vs. online shop), three product categories, different sorting of the products and if consumers could stop the evaluation. We theoretically extend the two factor model to a three factor model of serial evaluation of products of a category.

2. Theoretical development

Search processes in retail can be exploratory (i.e., those search processes that focus on finding more information about a product category, without a clear purchase goal: Bloch, Sherrell, & Ridgway, 1986) or goal-oriented (i.e., those that are targeted at purchasing a new product: Moe, 2003). For both search types, consumers' serial review of products of a category during a product search is a constructive process, influenced by the structure of the task (Bettman, Luce, & Payne, 1998). In online retail, particularly on mobile phones, the reaction to product visuals is almost automatic (Kahn, 2017) and, hence, susceptible to subconscious influences. These influences are likely more salient in online product evaluation, as cognitive capacities are depleted (Xu & Kim, 2008) over the usually very long series of reviewed products (Huang et al., 2009). Consequently, the position of a product in a series likely influences consumers' evaluations.

Serial exposures have been extensively studied for *similar* stimuli (Bornstein, 1989; Schmidt & Eisend, 2015) and described with a two factor model of fluency and tedium (Zajonc, 1968). We suggest that the characteristics of the serial evaluation of dissimilar products of a category require adding a third factor to the model: a leadership bias for the first product of the evaluation (2.1), in addition to conceptual fluency (2.2) and tedium (2.3). The level of these factors varies over the serial evaluation process, but they interact to form an S-shaped evaluation pattern of declining, improving and again declining evaluations. Finally, we introduce an overall boundary and moderators of the suggested process (2.4).

2.1. Primacy phase: leadership bias

The first factor in serial evaluations during product search is a positive bias for the initially viewed product. This leadership bias, also referred to as "leader-driven primacy" (Carlson et al., 2006, p. 513), has been widely documented for choice from serially presented product attributes (Brownstein, 2003). Consumers' need for consistency drives the leadership bias, such that later information is distorted in a subconscious effort to support an initially installed leader (Russo, Carlson, Meloy, & Yong, 2008). Specifically, consumers do not only reduce the weighting of later information (Büyükkurt, 1986), but subjectively perceive the later information in a way that favors the initial leader (Wallsten & Barton, 1982). Importantly, this process forms during the evaluation and in absence of previous preferences (Carlson et al., 2006; Russo, Meloy, & Medvec, 1998). As such, the leadership bias is a specific case of representational contrast effects (Lynch, Chakravarti, & Mitra, 1991), in that it only creates a downward bias in the perception of the item following the first item as initial leader.

We suggest that a leadership bias also occurs during the serial evaluation of products. Specifically, the first evaluated product profits from a leadership bias, while subsequently evaluated products suffer. The presence of leadership effects is intuitive when products are sorted by popularity (as common in e-commerce): as leaders are installed by favorable attributes (Carlson et al., 2006) and popularity and attribute utility should be correlated for the average consumer, the first product should have highest average utility and be subconsciously perceived as leader.

But the leadership bias towards the first option should also be independent of the product sorting. If ideal attribute levels are not pre-defined (e.g., as consumers search without any conditions to the product category), the reference system has to be

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