The Mere Search Effect:

Searching for Missing Product Attributes Increases Their Impact on Product Decisions

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** Web Appendix materials included from p.51.

ABSTRACT

Consumers often encounter missing information and must search for it before making a purchase. This research finds that such search behavior not only informs consumers, but also increases their reliance on the very information they found. We show that product attributes acquired via deliberate search have a greater influence on product decisions than when the same information is provided upfront and acquired without search. This happens because searching for specific information boosts its accessibility in memory, thereby increasing its salience and subsequent use in post-search product decisions. One secondary data study and seven pre-registered experiments provide evidence for our proposed effect and the underlying process. Alternative explanations, such as delayed presentation, search effort, dissonance effect, and recency effect did not fully account for our findings. The research inform existing theories and models of consumer search to consider not only what information was searched, but how it was searched. Our findings offer actionable insights for managers and policy makers regarding product information disclosure practices, channel promotion strategies, and mandated information disclosure policies.

Keywords: Consumer search, goal-directed search, goal-directed attention, accessibility, information disclosure practices

Searching for Missing Product Attributes Increases Their Impact on Product Decisions

When making a purchase, consumers often find some relevant information is only available with additional search. We ask—does this search affect subsequent product decisions? For example, consider a customer reviewing menu items at a restaurant. The menu shows the name, ingredients, and price of each meal. The customer has narrowed the options to chipotle ribs and rotisserie chicken. Chipotle ribs are cheaper and look tastier, but the customer also notices that the menu doesn't show calories. After browsing a separate brochure provided by the restaurant, the customer learns that there are 800 calories in the spicy chipotle ribs and 500 calories in the rotisserie chicken. After reviewing all the information again, the customer goes for the chicken. If the restaurant updated the menu with calorie information, would the customer have made the same decision? Does searching for a product attribute change how consumers evaluate their options? If yes, what does the effect look like, and why does this happen?

While past research has extensively studied the topic of information search, relatively little is known about whether the search behavior itself influences product decisions. This is surprising given the ubiquity of this behavior be it searching ingredients on the back of a package, looking up calorie information at a favorite restaurant, or looking up detailed amenity or price information for travel options. In all these cases, it is unclear whether different decisions would have been made if the same attribute information was available without search—whether the mere act of searching for missing information influences consumers' product decisions.

Our research shows that product attributes have a greater impact on post-search product decisions when consumers acquire them via search, compared to when the same information is provided upfront without search. This happens because the information receives a boost in its accessibility as consumers track the search target for the duration of search (Hautekiet et al.

2024), making the information more likely to be recalled and utilized after the search is completed (Fitzsimons & Morwitz, 1996; Morwitz, Johnson, & Schmittlein, 1993). We also show that search behavior is an integral part of this process, and provide evidence that a simple delay, search effort, recency effect, or dissonance cannot fully account for our findings.

This phenomenon has important practical implications. Managers decide whether to place product attribute information upfront for immediate exposure or place it in less accessible locations requiring consumers to perform search (Luca & Smith, 2013; Loewenstein, Sunstein, & Golman, 2014). If search behavior itself influences the impact of the search target, managers need to incorporate this mere effect of search to their information disclosure strategy. Recent government intervention indicates public interest in this phenomenon as well (Pohle, 2024; The White House, 2023). Policymakers target certain product information (e.g., calorie in fast food restaurants) for mandated disclosure to make it more accessible to consumers. For these policies to be effective, it would be useful to consider the ramifications of making an attribute accessible without search, understand why they happen, and select product information for mandated disclosure accordingly.

The remainder of this article is organized as follows. First, we describe the specific search behavior and the context we investigate in this paper. Then, we develop our key hypothesis about the post-search impact of the search behavior and our proposed mechanism. Next, we present eight studies demonstrating the proposed effect and its underlying process. We conclude with a discussion of theoretical, managerial and policy implications of our findings.

THEORETICAL BACKGROUND

Post-Search Impact of Additional Information Search

Consumers search for product attribute information to make informed purchase decisions. Often, a set of product information initially available to consumers omits certain attributes they would like to consider. This situation is not uncommon, since no single space—be it a product detail page, product packaging, or a hotel listings page—can cover all product information at once. For example, Amazon's product detail pages start with a short list of attributes that provide a summary of the product. This summary information is shown upfront as soon as consumers arrive at the page, requiring no additional search. Attributes omitted in this summary may be available further down the page or outside the Amazon store, requiring further search.

In this paper we examine the post-search impact of a product attribute based on whether consumers acquire it without or with information search. The former refers to cases where an attribute appears upfront (with other attributes) and is discovered immediately as consumers attend to a product. The latter refers to cases where the same attribute is initially missing and is acquired via information search. We refer to such search behavior as "goal-directed search" in this paper and investigate how it influences post-search decisions.

Despite an extensive amount of search literature within the field of consumer research (Anderson, Engledow, & Becker, 1979; Beatty & Smith, 1987; Moorthy, Ratchford, & Talukdar, 1997; Punj & Staelin, 1983), whether and how search behavior itself influences post-search product decisions (while holding the updated information constant) remains unclear. Indeed, research on consumer search focused more on antecedents of search—why, when, and how much consumers would search—and less on the aftermath of search (but see Gillison & Reynolds, 2018, on shopping satisfaction; Griffin & Broniarczyk, 2010, on choice satisfaction).

One of the properties of goal-directed search is its attentional control (Corbetta & Shulman, 2002). When consumers search for a product attribute that was initially missing, they

are directing their attention to a specific target rather than freely browsing until a target that merits further attention is identified (exploratory search; Janiszewski, 1998). This narrows consumers' attentional focus to the target as they pursue the goal of acquiring it (Hu et al., 2016; van Osselaer & Janiszewski, 2012). In the next section we elaborate how the attentional control employed for goal-directed search may affect how the search target is processed and used.

Goal-Directed Search and the Accessibility of Searched Information

Goal-directed search elicits goal-directed attention—"selection of sensory stimuli based on internal goals and expectations" (Hutchinson, Lu, & Weingart, 2016, p.65)—due to a clear presence of a specific search target. Goal-directed attention is employed as a top-down process where a person uses their cognitive resources to identify objects relevant to one's goals (Corbetta & Shulman, 2002). In information search contexts, goal-directed attention engenders two closely related tasks. First, consumers need to maintain the search target in their memory for the duration of the search (Woodman & Chun, 2006). For example, a consumer searching for calorie information of a Big Mac needs to keep track of the product-attribute pair "Big Mac-calorie" for the duration of their search. Second, consumers need to process stimuli associated with the search target (Hutchinson et al., 2016). The same consumer may have had to type in "McDonald's menu nutrition information"—a query associated with the search target—in a search engine to get access to a nutrition fact sheet. Once the sheet is found, they need to be alert to values that directly reference their search target (e.g., "Big Mac", "Calories").

These tasks—temporary storage of the target information and processing associated stimuli—are handled by consumers' working memory (Baddeley, 1992; Baddeley, Hitch, & Allen 2009). Working memory serves as a "system that can keep information active and accessible for ongoing cognition" (Hautekiet et al., 2024, p.564), making it indispensable for

ongoing thoughts or actions (Vergauwe & Langerock, 2017). Information that is maintained for search acts as a self-generated cue that guides the search process by drawing attention to salient, relevant stimuli yet to be fully attended (Hutchinson et al., 2016). In summary, goal-directed search is sustained by goal-directed attention utilized for maintaining the search target in one's attentional focus and processing objects that one believes will lead to the search target due to their associative links (Barrouillet et al. 2007).

Recent cognitive psychology literature shows that the information maintained in one's working memory receives a boost in its accessibility. Maintaining a piece of information in one's working memory requires executive control, conferring "privileged state" to the limited number of objects being kept fresh (Hu et al. 2016, 2165). Target information is maintained so that it is readily available when goal-relevant associations can be made (Ester & Pytel 2023). In turn, this readiness increases the accessibility of the information—the likelihood that the information will be activated for later use (Hautekiet et al., 2024; Janiszewski, 1993; Vergauwe & Langerock, 2017). Because additional information search—due to its goal-directed nature—requires the search target to be maintained in working memory, we predict that a similar cognitive process will be elicited: when consumers actively search for a particular product attribute that was initially missing, the attribute receives a boost in its accessibility. In turn, accessibility increases the likelihood that the attribute will be used as an input for subsequent judgments and choice (Feldman & Lynch, 1988; Fitzsimons & Morwitz, 1996; Morwitz, Johnson, & Schmittlein, 1993; Herr, Kardes, & Kim, 1991), including post-search product decisions.

THE CURRENT RESEARCH

In one secondary data and eight pre-registered experiments we examine the post-search impact of goal-directed search by manipulating how a product attribute is acquired—whether it

is acquired via goal-directed search or provided upfront in the initial set of product information. We predict that a product attribute will have a greater impact on product decisions (e.g., relative preference, choice) when consumers acquire attribute information via search, compared to when the same information is available without search (H1). Further, we hypothesize this is due to consumers having to track the search target during search, which increases its accessibility and the likelihood that it will be used for subsequent responses. Since ease of retrieval is a close proxy of information utilization (Feldman & Lynch, 1988), we predict that participants who acquire the target attribute via search (vs without search) will recall the attribute better post-search (H2) and recall performance will mediate the main effect (H3).

Throughout our experimental studies we manipulate how participants obtain information about a product attribute. In the "no search" condition participants are provided with full information of alternatives. In the "search" condition, value(s) of an attribute is missing, and participants are prompted to acquire it via search. To isolate the post-search impact of goal-directed search, the content of product attribute information available to participants was held constant across conditions. Information search behavior was conducted by all participants in the search condition to eliminate self-selection issues and inference-making based on one's decision to search. Figure 1 illustrates our search manipulation.

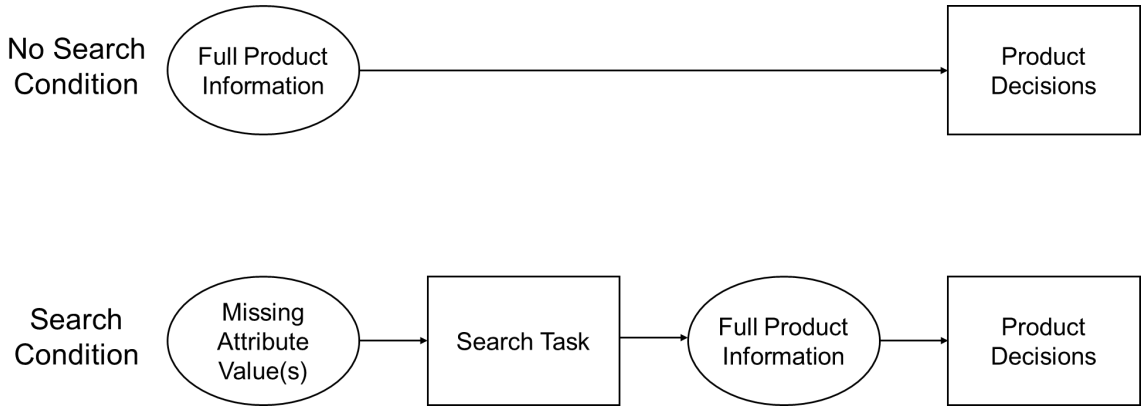

Figure 1. Experimental process for participants in no search and search conditions.

We implement search tasks that require the search target to be tracked for the duration of search. These tasks involve search behaviors such as selecting relevant search queries (Melumad, 2023) or alternatives (Diehl, 2005), clicking on an area of interest associated with the search target (Moe, 2003), and visual browsing (Hutchinson et al., 2016). The exact composition of behavioral elements within a search task are heterogeneous across studies depending on the focal product category and the attribute being searched.

Table 1
Study Overview

Study	*Search Manipulation*	*Product Category*	*Focal Attribute Being Searched*	*Product Decisions*	*Findings*
Pilot Study	Comparison of travel agency websites (secondary data)	Hotels	Total price (negative valence)	Review Score	Same hotels received lower review score when listed on a website where consumers search beyond listings page for total price
Study 1	Search vs No Search	Hotels	Total price (negative valence)	Relative Preference	A more expensive hotel was preferred less when total price was searched
Study 2	Search vs No Search	Bluetooth speakers	Waterproof capability (positive valence)	Relative Preference	A Bluetooth speaker with better waterproof rating preferred when the rating was searched
Study 3	Search vs No Search	Malaria drugs	Side effects (negative valence)	Relative Preference	Relative preference for a Malaria drug with worse side effects was lower when side effects value was searched; main effect mediated by recall performance of the focal attribute
Study 4	Search vs No Search vs Delay	Malaria drugs	Side effects (negative valence)	Relative Preference	Replication of Study 3; demonstrates the role of goal-directed search behavior; excludes simple delay as an alternative explanation
Study 5	Voluntary Search vs No Search	Malaria drugs	Side effects (negative valence)	Relative Preference	Replication of Study 3; demonstrates main effect when participants voluntarily chose to search
Study 6	Search (chosen target) vs Search (imposed target) vs No search	Meal kit providers	Nutritional information disclosure score (positive valence)	Choice	A meal kit provider with better information disclosure score was chosen more often when score was searched; excludes search effort and dissonance explanations
Supp. Study 1	Search vs No Search	Restaurants	Kid-friendly score (positive valence)	Choice	A restaurant with higher kid-friendly score was chosen more frequently when the score was searched
Supp. Study 2	Search vs No Search	Malaria drugs	Side effects (negative valence)	Relative Preference	Replication of Study 3; excludes recency effect as an alternative explanation

Note. Supplementary Study 1 & 2 are included in the Web Appendix

Table 1 provides an overview of studies. In Pilot Study we aimed to obtain real-world evidence of our main effect (H1). Study 1 experimentally tested the main effect in the same context. Study 2 and Supplementary Study 1 enhance the generalizability of our main effect using different product categories and focal attributes that are positively valenced. Study 3, 4, 5,

and Supplementary Study 2 test both our main effect and our proposed process using a surprise recall task (H2, H3). Study 5, Study 6, and Supplementary Study 2 also address alternative explanations.

PILOT STUDY: HOTEL REVIEW SCORES FROM ONLINE TRAVEL AGENCIES

We sought to examine our focal search phenomenon in a real-world environment. To this end, we identified popular travel agency websites with different disclosure practices for total price of hotels—whether the information was provided upfront on the hotel listings page or required further search beyond this page.

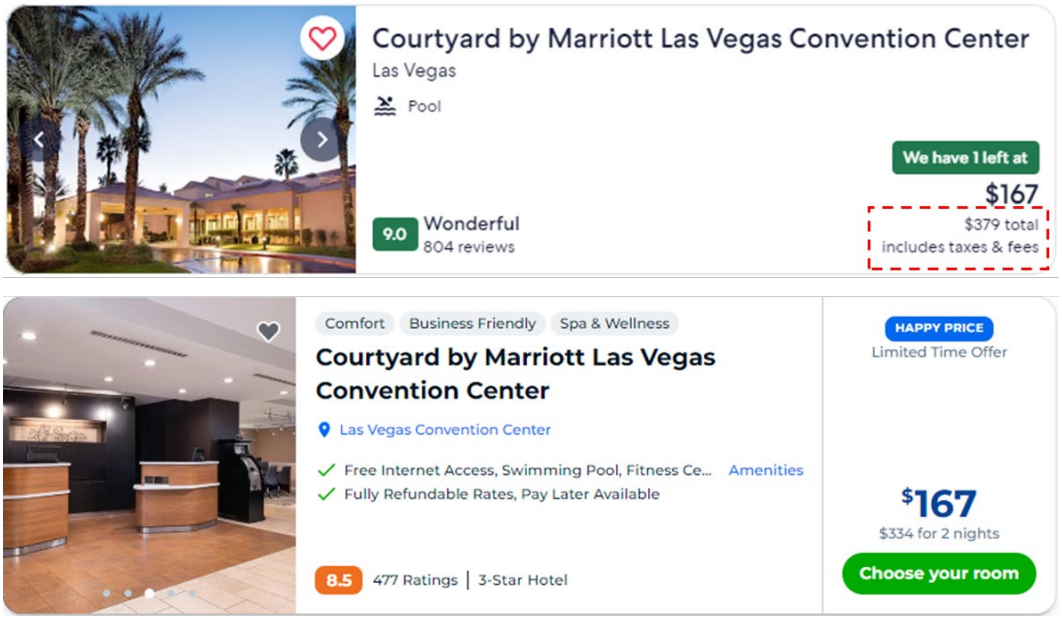

Figure 2. Example of total price provided (up) or missing (bottom) from a hotel listings page.

Consumers visit travel agency websites to compare different hotels before making a reservation. These websites facilitate the process by providing a list of hotels that match consumers' itinerary on a listings page, where consumers can easily compare attributes of different hotels (e.g., price, review score, amenities). Importantly, websites have different total price disclosure policies. For example, some online travel agencies provide total price on their listings page, while others only provide base room rates, but not taxes and extra fees (e.g., resort

fees) on the page. This provides an opportune context to test H1, as some consumers acquire total price information immediately on the listings page, while others learn the same information by clicking on a listed hotel and browsing beyond the listings page (Figure 2). Review scores of hotels that were listed on two or more of these websites were compared to test the impact of total price disclosure practice on consumer product judgment.

Method

Data Source Description. Data were obtained from popular online travel agency websites. We started with a list of online travel agencies based in the U.S. Then we excluded aggregator platforms (e.g., Tripadvisor) and subsidiary websites (e.g., Hotels.com) that shared review data with other websites. This left us with a final list comprised of Expedia, Priceline, and Booking.com (see Web Appendix A for detailed data source selection and collection procedure).

Users of these websites follow a similar information search and reservation process. Importantly, these websites differed on our critical factor of interest—total price (base room rates + taxes + fees) disclosure practice, which determined whether a user saw total price of hotels upfront on the listings page with other key hotel attributes (e.g., hotel name, location, review score, amenities), or acquired the same information via goal-directed search. Expedia (https://www.expedia.com/) provided the total price of hotels on their listings page by default. Priceline (https://www.priceline.com/) and Booking.com (https://www.booking.com/) showed only the base room rate on the listings page. This meant that Priceline and Booking.com users had to perform goal-directed search beyond the listings page if they considered total price of multiple hotels (i.e., not confirming reservation of the first hotel they clicked on).

Assumptions and Prediction. We considered the price attribute as negatively valenced, as the quality of the hotel one stayed in is fixed by the time a review score is recorded. Based on

H1, we assumed that this negative impact of price attribute would be larger for Priceline and Booking.com users (vs Expedia users), as they had to perform goal-directed search to acquire the total price information. We also assumed that this increased impact at the time reservation decision was made would also be reflected in review scores, based on prior research suggesting that information maintained in one's working memory (e.g., when total price is searched) is better learned and encoded in one's long-term memory (Baddeley, 2003; Fukuda & Vogel, 2019). This would make price attribute more likely to be recalled and considered when users leave their review scores. In summary, we predicted that same hotels will have received lower review scores when listed on Priceline or Booking.com (compared to Expedia).

Results

Table 2 presents summary statistics of review scores from each site in aggregate. The main outcome of interest was guest review score differences for same hotels between the three websites. Paired samples t-tests revealed that same hotels received significantly lower guest review scores when listed on Priceline (M = 7.96, SD = .89) than Expedia (M = 8.34, SD = 1.00, d = −.39, $t(139) = 12.11$, $p < .001$). The same was true when comparing Booking.com (M = 7.98, SD = .91) and Expedia (M = 8.41, SD = 1.01, d = −.43, $t(106) = 11.07$, $p < .001$). Finally, guest review scores for the same hotels on Priceline and Booking.com were not significantly different (d = .02, $t(130) = 0.85$, *ns*).

Table 2
Summary statistics of guest review scores per website.

	Mean	**SD**	**Min**	**Median**	**Max**	**No. of Hotels**
Expedia	8.33	1.00	5.00	8.60	9.80	154
Priceline	7.74	1.16	2.40	8.10	9.70	214
Booking.com	7.82	1.16	2.40	8.20	10.00	137

One concern with these findings is that the results could be driven by hotels charging resort fees rather than a more generalizable search effect. Our hypothesis predicts that same hotels will receive lower review scores on Priceline and Booking.com regardless of whether resort fees were charged or not, since total price is always higher than base room rate (due to tax) and goal-directed search will increase the impact of the price attribute.

To disentangle the effect of resort fees we use a linear mixed-effects regression model with review scores as the DV, websites, resort fees (no vs yes), and the interaction of the two as fixed effects, and random effects for hotel-level intercepts. The models were tested using the lme4 package in R. Denominator degrees of freedom were estimated with Kenward-Rogers approximation using LmerTest package (Kuznetsova, Brockhoff, & Christensen, 2017).

For Expedia vs Priceline the website x resort fees interaction term was not significant at the .05 level, $F(1, 103) = 3.07$, $p = .083$. For Expedia vs Booking.com the same interaction term was significant , $F(1, 103) = 9.16$, $p = .003$. Post-hoc analysis revealed that review scores were significantly lower for Booking.com both when resort fees were present, $d = -.26$, $t(103) = 3.71$, $p = .002$, or not, $d = -.51$, $t(103) = 13.15$, $p < .001$. In summary, hotels received lower review scores on Priceline or Booking.com (vs Expedia) regardless of resort fees being charged or not.

Finally, we examined the robustness of these findings by considering the role of relative hotel prices. We posited that higher prices would have a greater negative impact on the evaluation of hotels after accounting for quality—if searching for the full price of a hotel increased the impact of price attribute, the size of this impact on review scores would be greater when the nominal price level is higher. We standardized base room rates (information guaranteed to be readily accessible to all users) within the same website and within hotels with the same star rating (e.g., 3-star hotel; a hotel's star rating reflects features and amenities and is independent of

its guest review score). Therefore, standardized rates represented the price level of a hotel relative to other hotels of comparable quality. Then, we added standardized rates and corresponding interactions as fixed effects to the linear mixed-effects model.

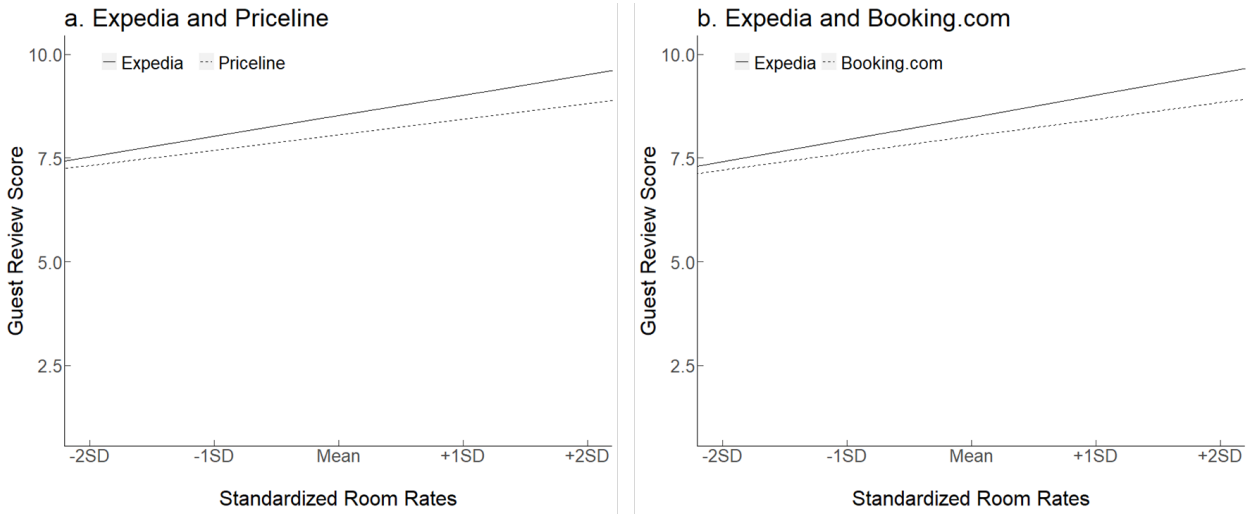

Figure 3. Predicted guest review score comparisons.

For Expedia vs Priceline, the website X resort fees X standardized rates 3-way interaction was not significant, $F(1, 101.62) = .12$, $p = .732$. The highest order interaction term of interest that was significant was website X standardized rates, $F(1, 101.62) = 4.72$, $p = .032$. Post-hoc analysis revealed that review scores were significantly lower in Priceline overall, but the difference was larger when a hotel's price was more expensive (+1 *SD*), $d = -.51$, $t(102) = 5.57$, $p < .001$ than when it was cheaper (−1 *SD*), $d = -.30$, $t(101) = 6.37$, $p < .001$, relative to comparable hotels (Figure 5a). For Expedia vs Booking.com, the website X standardized rates interaction was again the highest order interaction term of interest that was significant, $F(1, 121.13) = 15.67$, $p < .001$. Post-hoc analysis revealed an identical pattern as in Expedia vs Priceline; review scores were significantly lower in Booking.com overall, but the difference was larger when a hotel's relative price was more expensive (+1 *SD*), d = −.67, $t(114) = 7.16$, $p < .001$, than when it was cheaper (−1 *SD*), d = −.25, $t(113) = 4.77$, $p < .001$ (Figure 5b). These

results add further support for our prediction that performing goal-directed search for the full price of a hotel would increase its impact on hotel evaluations.

Discussion

The results provide support for the main effect that goal-directed search increases the impact of the searched product attribute (H1). Hotels received lower review scores when they were listed on websites where users had to search beyond the listings page to find total price information. Moreover, review score differences were greater when the relative price of a hotel was higher, providing further evidence that searching for the total price information increased the impact of the price attribute. If Priceline and Booking.com users gave lower review scores because they were surprised by additional costs, the score differences (vs Expedia) would not be affected by standardized base rates of hotels—if anything, the surprising nature of resort fees would have been more pronounced when the base room rate of a hotel was relatively cheaper, as resort fees are charged at a flat rate per room.

We contend that the most critical difference between these websites was their price disclosure practices, as these websites provide comparable information (e.g., list of amenities, check-in/out policies, location, review scores), similar website structure in regard to the on-site user behavior (e.g., itinerary settings, page structure), and identical review score calculation method of aggregating the "overall score" submitted by guests then dividing it by the number of submissions (Booking.com, 2024; Expedia, 2024; PR Newswire, 2010). The base room rates between websites for the same hotels were not significantly different, $F(2, 208) = .56$, $p = .575$.

Our findings are not without limitations. The correlational nature of Study 2 means our findings are susceptible to confounds or methodological limitations. To address these

shortcomings, we followed up with an experimental replication of the main effect in a similar decision context as in Pilot Study.

STUDY 1: HOTEL RESERVATION DECISION

In Study 1 we test our main effect (H1) using the same online hotel reservation context as in Pilot Study. We conducted a pre-registered experiment (see https://researchbox.org/3776&PEER_REVIEW_passcode=XUJYWX for all pre-registration, data, and study materials) where we manipulated whether participants searched for total price information of hotels or had immediate access to the information on the listings page while holding all other factors constant. We predicted that the price attribute would have a greater impact on participants' post-search preference when participants acquired total price information by performing search beyond the listings page.

Method

Participants and Procedure. We recruited 400 participants from Prolific (51.4% female, M_{age} = 35.6) consistent with our pre-registration. Participants first read a cover story that they were planning a trip to Las Vegas for 3 days and were looking for a hotel near the Las Vegas Strip. After being reminded of their itinerary (location, dates, number of travelers) participants were told that they found two hotels to consider.

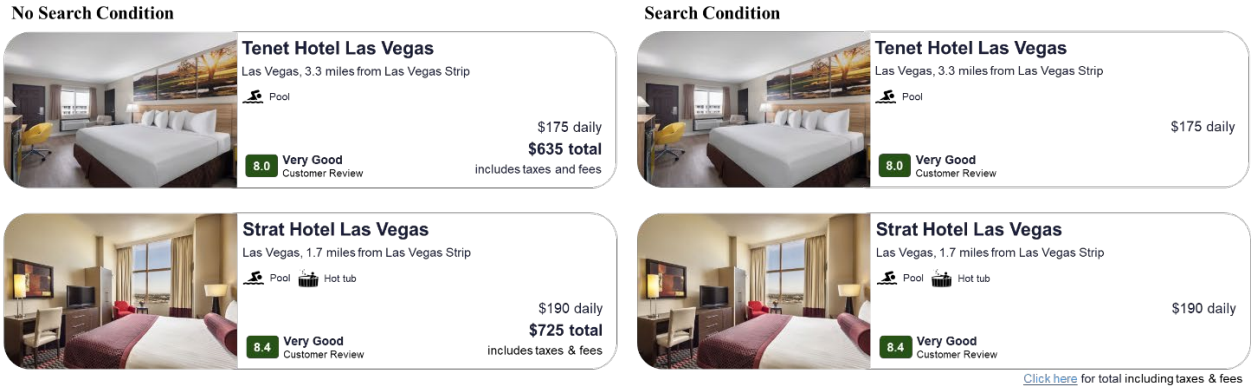

Figure 4. Hotel stimuli for no search (left) and search (right) conditions.

On the next page, participants saw two hotel options in a format similar to actual online travel agencies' listings page (Figure 4). Two hotel options ("Tenet Hotel" and "Strat Hotel") were described by their names and four product attributes—distance from the Strip, amenities (e.g., pool), customer review score, and price (base room rate and total price). All attributes favored "Strat Hotel" except price.

In the "no search" condition both the base room rate and the total price information was provided. It was explicitly mentioned that the total price included taxes and fees. Participants stated their relative preference between the two hotels with full information on a 6-point scale (1: "Strongly prefer Tenet Hotel", 6: "Strongly prefer Strat Hotel"), the lower score of which indicated a greater preference for the cheaper option.

In the "search" condition price information only included base room rate. A hyperlink text at the bottom read "Click here for total including taxes & fees" (Figure 3). Clicking on this hyperlink advanced participants to the search task, which consisted of two sequential search query selection that required participants to keep track of stimuli relevant to the search target (i.e., total price of Tenet Hotel and Strat Hotel). For the first query, participants selected the names of the hotels they'd like to know the total price of. Two of the three hotel options presented were relevant. For the second query, participants selected the information they wanted to obtain. Only one query ("total price") out of four query options was relevant. Participants who selected a wrong query were instructed to attempt the search again. Upon successful search, participants saw the full information of both hotels—identical to the full information provided to those in the no search condition—and stated their relative preference. Lastly, all participants recorded their frequency of visits to Las Vegas (1: "Never", 5: I live in/near Las Vegas") and

familiarity with online travel agency websites (1: “Not at all”, 4: “Very much”). These measures did not influence our main findings and are not discussed further.

Results

A one-way ANOVA revealed a significant difference in relative preference, $F(1, 398) = 8.54$, $p = .004$, $\eta_p^2 = .021$, such that the preference for more expensive hotel was lower for those who searched the total price ($M = 3.30$, $SD = 1.90$) compared to those who had access to full information without performing search ($M = 3.83$, $SD = 1.78$; see Figure 4).

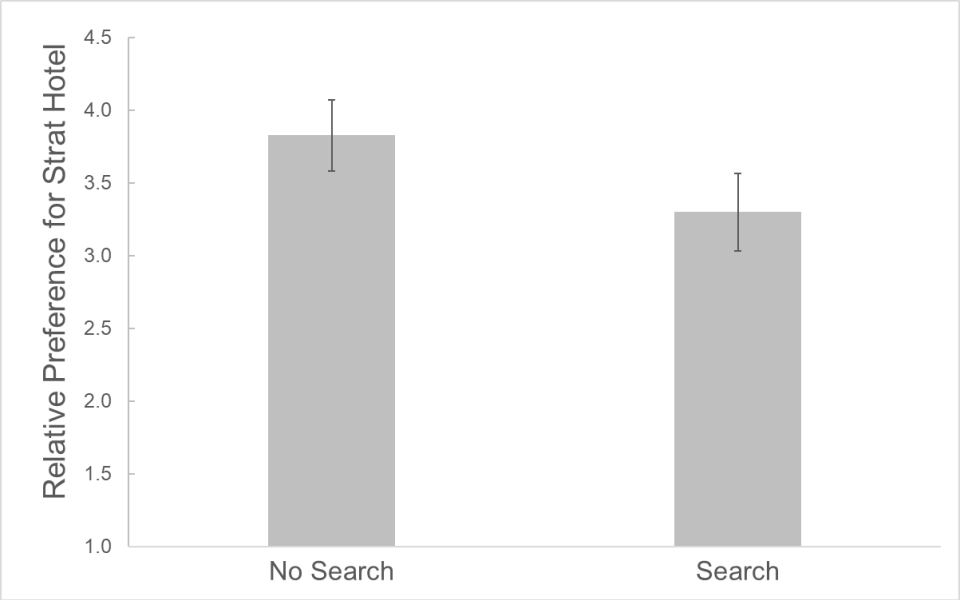

Figure 5. Relative preference for more expensive hotel (Strat Hotel).

Discussion

In Study 2 we found support for H1 using realistic stimuli and a search context that resembled that of our Pilot Study. Participants who searched for total price information showed lower preference for the more expensive alternative compared to those who learned full price information on the listings page. This suggests that goal-directed search increased the impact of the price attribute on participants’ post-search decision.

STUDY 2: ONLINE RETAILER CONTEXT

In pre-registered Study 2 we test our main effect (H1) with a different product category, positive focal attribute (vs negative), and a more generalizable search task manipulation. The search task in Study 1 provided a specific set of tasks (alternative and search query selection) for participants to perform. This ensured that search takes place but imposed behavioral restrictions as well. The search task in Study 2 consists of product stimuli in an online retailer context, where participants attend to two sets of product attributes—a short summary and a more detailed list—on a page in an unrestricted manner. We manipulated search behavior by omitting a focal attribute value in the summary section, requiring participants to search for it in the detailed attribute list. This also allowed us to expose the same set of stimuli to all participants.

Method

We recruited 600 participants from Prolific, but one additional participant completed our study due to submission error, resulting in the final sample size of N=601 (50.4% female, M_{age} = 40.7). We instructed participants to imagine they are browsing an online retailer store to purchase a Bluetooth speaker. Participants read five key attributes that they were interested in ("Sound System", "Playtime", "Waterproof", "Weight", and "Price"). Next, participants read that they found two speakers (Bluetooth speaker A and B) to compare, and that the product page offered by the store displays a "summary sheet" at the top that consists of key attributes in consideration, and "product details" that includes both key attributes and other attribute information as well (e.g., "Bluetooth version", "Weight", "Size").

Stimuli used for the search task were presented on a single page that included both the summary sheet and product details. The summary sheet and product details were separated vertically so that summary sheet was provided upfront, whereas product details required participants to scroll down (similar to actual product pages on online retailer stores). Exposure to

both information sets was guaranteed, since participants could only advance to the next stage by scrolling to the bottom of the page (see Web Appendix C for full search task stimuli).

The focal attribute was “Waterproof Rating”, which favored Bluetooth speaker B. Upon arriving at the product page, participants in the “no search” condition saw full information for both summary sheet and product details. Then, they advanced to the next page where the summary sheet was presented again, and they stated their relative preference between the two speakers on a 6-point scale (1: “Strongly prefer Speaker A”, 6: “Strongly prefer Speaker B”), the higher score of which indicated greater preference for the speaker favored by the focal attribute.

Participants in the “search” condition first saw the summary sheet with the focal attribute value missing for both speakers. Participants were prompted about the missing attribute value to make sure they understand that the value is missing from the summary sheet, rather than the attribute being not applicable to the speakers. Next, participants advanced to the product page with both the summary sheet and product details. Here, the focal attribute value of both alternatives on the summary sheet were replaced with a text, “Check Product Details Below”. Then, participants advanced to the next page where they saw the summary sheet again (updated with focal attribute values) and stated their relative preference. Note that we did not impose any restrictions on participants’ search behavior.

This manipulation allowed us to examine the impact of participants’ goal-directed search behavior beyond the summary sheet, while exposing the same set of stimuli to those in both search and no search conditions. We assumed that those in the no search condition would not perform a goal-directed information search while viewing the product details section since the summary sheet included all key attributes in consideration. In contrast, we assumed that those in the search condition would perform goal-directed information search when viewing the product

details section, as they are actively searching for waterproof rating values missing from the summary sheet. Attributes that only appeared in the product details section did not favor either speaker, allowing us to isolate the impact of the search behavior. In turn, we predicted that participants in the search condition would prefer speaker B (favored by the attribute) more than those in the no search condition.

Results

A one-way ANOVA revealed a significant difference in relative preference, $F(1, 599) = 6.76$, $p = .010$, $\eta_p^2 = .011$. Participants in the search condition preferred the alternative favored by the focal attribute more ($M = 3.26$, $SD = 1.71$) compared to those in the no search condition ($M = 2.89$, $SD = 1.71$), supporting H1.

Discussion

Participants in both no search and search conditions saw the same stimuli utilized for the search task. The critical difference was that participants in the search condition were more likely to be engaged in a goal-directed information search than those in the no search condition while attending to the stimuli. The amount of time participants spent examining product-relevant stimuli throughout the study was only directionally greater in the search condition, $M = 63.2$s, than in the no search condition, $M = 57.5$s, $F(1, 599) = 2.10$, $p = .148$, and did not mediate the effect of search manipulation on relative preference. This suggests that it was not how long participants spent examining the product stimuli, but the presence of goal-directed search behavior that caused the preference difference. These results add support to our hypothesis that engaging in goal-directed search changes the underlying cognitive process—a boost in accessibility of the search target leading to its increased post-search impact on product decisions. In the next study we directly test this proposed mechanism using a surprise recall task.

STUDY 3: RECALLING SIDE EFFECTS OF A MALARIA DRUG

The primary goal of pre-registered Study 3 was to directly test the underlying process of our main effect. We posited that when consumers acquire a product attribute via goal-directed search (vs no search) it will be recalled better (H2) and impact product decisions to a greater extent (H3). To this end, we implemented a surprise recall task after participants made their product decisions to capture accessibility of the focal attribute value. Specifically, we instructed participants to recall attributes of a malaria drug associated with the searched attribute information. We chose a relatively unfamiliar product category to attenuate the concern that participants may recall information stored in their long-term memory instead of the information we provide.

Method

Participants and Procedure. We recruited 650 participants from Prolific, of which 648 (52.5% female, M_{age} = 40.6) completed the study. Participants read that they were considering purchasing a malaria drug before going on a safari tour in Kenya. Then, they were randomly assigned to "no search" or "search" condition. Participants in the no search condition saw attribute information of two malaria drugs, "Chloroquine" and "Mosquirix". Five product attributes ("Ease of Usage, "Effectiveness", "Use Restrictions", "Side Effects", "Price"), their score values, and descriptions were provided for both options. Our focal attribute was side effects, which was pretested to favor Chloroquine over Mosquirix (see Figure 6). Participants stated their relative preference of the drugs on the same page on a 6-point scale (1: "Strongly prefer Chloroquine", 6: "Strongly prefer Mosquirix"). For those in the search condition the attribute value score and description of side effects attribute for Mosquirix were not provided.

Instead, participants clicked on a message, “Click here to search for this information” to advance to the search task.

	Chloroquine	**Mosquirix**
Ease of Usage	7.0 / 10 Begin 2 weeks before travel, weekly during travel, and 4 weeks after travel.	7.5 / 10 Begin 1-2 days before travel, weekly during travel, and 4 week after travel.
Effectiveness	8.0 / 10 Effective at prevention/treatment of Malaria; few Malaria variants more resistant to the drug	9.0 / 10 Excellent at prevention/treatment of Malaria; minimal drug resistance reported
Use Restrictions	7.5 / 10 Drug use restricted to persons with no pre-existing psychological and cardiac conditions	8.0 / 10 Can be taken by people with pre-existing psychological or cardiac conditions
Side Effects	9.0 / 10 Mild upset stomach	7.0 / 10 Mouth sores, nausea, headache, dizziness, vomiting, diarrhea
Price	$39.99	$39.99

Figure 6. Malaria drug information.

The search task required participants to keep track of the search target by asking them to choose search queries about the product category (malaria drugs), name of the focal drug (Mosquirix), and the attribute they are searching for (side effects). As before, participants who made a wrong query were returned to the previous stage. Upon successful search participants saw the list of side effects for Mosquirix. Then, participants saw the full information identical to the no search condition and stated their relative preference of the drugs.

Surprise Recall Task. Next all participants performed a surprise recall task. Participants were asked to recall attributes of Mosquirix as they “come to their mind” and type those in text boxes. Six text boxes were labeled “Attribute 1” to “Attribute 6”, placed from top to bottom. There were no instructions in terms of how many text boxes were used nor what participants typed in each box. That is, the number of attributes and attribute values participants recalled were entirely up to them. After the recall task we measured participants’ prior experience of

purchasing a malaria drug (1: “Never”, 4: “Many times”) and familiarity with specific malaria drugs presented in the study (1: “No”, 2: “Yes, 3: “Not sure”). These measures did not significantly influence our results and are not discussed further.

Because side effects are negatively valenced, and Mosquirix had a lower score for the attribute, we predicted that participants who searched the side effects value of Mosquirix would prefer it less (H1). Furthermore, we predicted that participants who perform goal-directed search for the attribute would recall it better due to its heightened accessibility (H2). Recall performance was measured with three pre-registered metrics: 1) whether relevant information was recalled (binary), 2) how early relevant information was recalled (rank), and 3) how many relevant information bits were recalled (continuous). Lastly, we predicted recall performance would mediate the effect of goal-directed search on relative preference (H3).

Results

Drug Evaluation. Consistent with our earlier studies, a one-way ANOVA revealed a significant difference in relative preference of drugs between conditions, $F(1, 646) = 15.72$, $p < .001$, $\eta_p^2 = .024$, such that the relative preference for the focal drug associated with worse side effects was lower for participants who searched the information ($M = 3.34$, $SD = 1.66$) compared to those who did not perform search ($M = 3.85$, $SD = 1.60$).

Coding Scheme of Recall Responses. We first counted the number of information bits in each text box directly referencing the side effects attribute of Mosquirix. For example, a text box response “side effects” was coded as 1, whereas a text box response “mouth sores, nausea, headache” was coded as 3. Responses that were clearly incorrect (e.g., “no side effects”) or referred to Chloroquine (e.g., “upset stomach”) were not counted.

Based on the above coding scheme we calculated three pre-registered recall performance metrics per participant. First, *binary recall indicator* was assigned based on whether relevant information was recalled (1) or not (0). Second, *recall rank* was equal to the number of the first text box with relevant information (between 1 and 6; smaller rank indicates earlier recall). If no relevant information was recalled a rank of 7 was assigned. Third, *recall count* was the sum of the number of relevant information bits recalled across all text boxes.

Recall Performance. Chi-squared test showed that participants in the search condition were more likely to recall relevant information at all (72.8%) than those in the no search condition (56.7%), $\chi^2 = 18.39$, $df = 1$, $p < .001$. Mann-Whitney U test was used to compare the average rank of relevant recall between no search and search conditions. Participants in the search condition (N = 320) had a lower mean recall rank of 289.13 than those in the no search condition (N = 328) with a mean rank of 359.01. A statistically significant difference was found, $U = 41{,}160.50$, $Z = -4.90$, $p < .001$, indicating that relevant information was recalled sooner in the search condition. Lastly, one-way Anova showed that recall count was higher for those who searched, $M = 1.14$, $SD = 1.12$, than those who did not, $M = 0.92$, $SD = 1.16$, $F(1, 646) = 6.38$, $p = .012$, $\eta_p^2 = .010$, indicating greater number of relevant information bits was recalled in the search condition. These results suggest that the focal attribute information was more accessible in participants' memory when it was searched versus not searched.

All three recall performance measures significantly predicted a lower preference for the focal drug disfavored by the searched attribute. Relative preference for Mosquirix was lower for those who recalled relevant information, $M = 3.33$, $SD = 1.57$, than those who did not, $M = 4.09$, $SD = 1.66$, $F(1, 646) = 32.54$, $p < .001$, $\eta_p^2 = .048$. Earlier recall (reverse-coded recall rank), $r = -.31$, $p < .001$, and recall count predicted a lower preference for Mosquirix, $r = -.19$, $p < .001$.

Mediation by Recall Count. We next tested the mediating role of recall performance in predicting product evaluation. For this purpose, we conducted a mediation analysis using 5,000 bootstrapping draws (Hayes 2022; model 4), with search manipulation as the IV, relative preference as the DV, and recall count as the mediator. A significant indirect effect was found (95% CI = −.06 [−.115, −.013]). Participants who performed search for the side effects attribute recalled a greater number of relevant information bits, which predicted lower preference for the drug associated with the attribute (Figure 7). We also observed significant mediation with recall rank as the mediator after treating it as a continuous variable (95% CI = −.18 [−.280, −.099]).

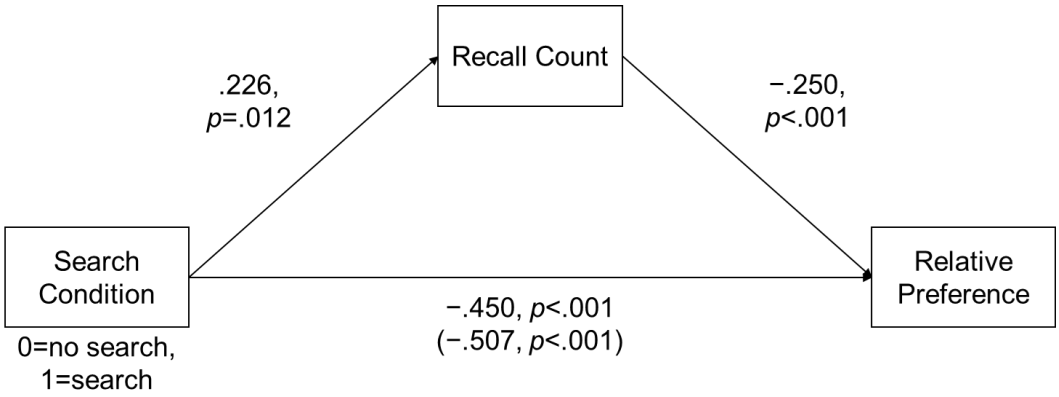

Figure 7. Mediation analysis (Study 3).

Discussion

Results of Study 5 provide support for our hypotheses. Participants who searched the focal product attribute stated lower preference for the product disfavored by the attribute (H1). These participants also showed superior recall performance of the searched attribute (H2). Finally, recall performance significantly mediated the relationship between goal-directed search and preference, providing support for our accessibility explanation (H3).

STUDY 4: TESTING THE ROLE OF INFORMATION SEARCH BEHAVIOR

The primary aim of pre-registered Study 4 was to test the critical role goal-directed search plays in our focal phenomenon. We hypothesized that goal-directed search increases the

accessibility of the search target due to the target being maintained in one's working memory for the duration of the search, leading to better recall of the target (H2) and an increase in its impact on post-search product decisions (H1, H3). A critical component of these hypotheses is that consumers search for a specific target—the existence of a goal-directed search behavior. Therefore, removing the search behavior—merely presenting the focal attribute value with a delay—should significantly reduce our proposed effect as the attribute need not be maintained in one's working memory. Specifically, we predicted that both post-search recall performance of the focal attribute and its impact on product decisions will be lower when the attribute information is presented with a delay compared to when it is acquired via search (H4).

Method

We recruited 900 participants from Prolific, of which 895 (52.3% female, 45.7% male, 1.4% other, .6%, preferred not to state, M_{age} = 39.2) completed the study. Study design and stimuli were identical to Study 4 except for the newly added "delay" condition. Participants in this condition were first presented with information of the two drugs with missing value for the focal attribute (side effects of Mosquirix). However, instead of performing a search task, participants were told that some product information may become available later. In the next page participants stated their relative preference with full information, now updated with the focal attribute value that was previously missing. All participants performed the same surprise recall task as in Study 3.

Results

Drug Evaluation. A one-way ANOVA revealed significant differences in relative preference, $F(1, 892) = 36.37$, $p < .001$, $\eta_p^2 = .075$. Tukey's HSD test revealed that the relative preference for the drug disfavored by the side effects attribute was significantly lower for

participants in the search condition (M = 3.38, SD = 1.66) compared to those in the no search condition (M = 3.82, SD = 1.69, d = −0.43, p = .003) and in the delay condition (M = 4.52, SD = 1.55, d = −1.13, p < .001) respectively (see Figure 8).

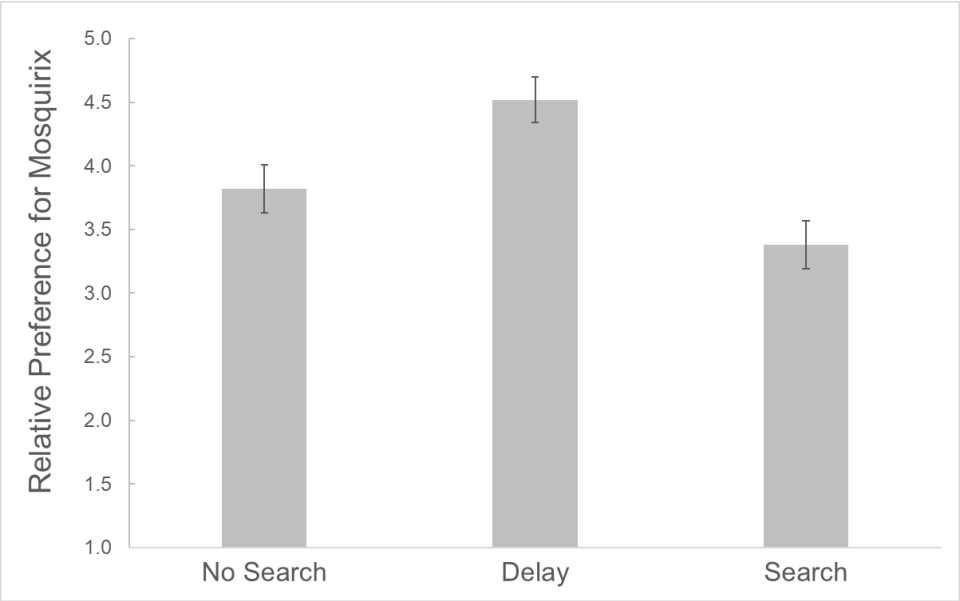

Figure 8. Relative preference for drug with worse side effects (Study 4).

Recall Performance. We first report recall performance comparisons between no search and search conditions. Chi-squared test showed that participants in the search condition were more likely to recall relevant information (68.8%) than those in the no search condition (54.8%), χ^2 = 12.38, df = 1, p < .001. Mann-Whitney U test revealed that participants in the search condition (N = 298) had a smaller mean recall rank of 279.53 than those in the no search condition (N = 301) with a mean rank of 320.27. A statistically significant difference was found, U = 38,747.50, Z = −2.99, p = .003. Lastly, one-way Anova showed that recall count was higher in the search condition, M = 1.15, SD = 1.18, than those in the no search condition, M = 0.74, SD = 0.90, F(1, 597) = 22.78, p < .001, η_p^2 = .037.

The same comparisons between delay and search conditions revealed an identical set of patterns. Chi-squared test showed that participants in the search condition were more likely to

recall relevant information (68.8%) than those in the delay condition (38.5%), $\chi^2 = 54.76$, $df = 1$, $p < .001$. Mann-Whitney U test revealed that participants in the search condition (N = 298) had a smaller mean recall rank of 248.11 than those in the delay condition (N = 296) with a mean rank of 347.23, and the difference was significant, $U = 29{,}384.50$, $Z = -7.46$, $p < .001$. One-way Anova showed that recall count was significantly higher in the search condition, $M = 1.15$, $SD = 1.18$, than in the delay condition, $M = 0.61$, $SD = 1.01$, $F(1, 592) = 35.59$, $p < .001$, $\eta_p^2 = .057$.

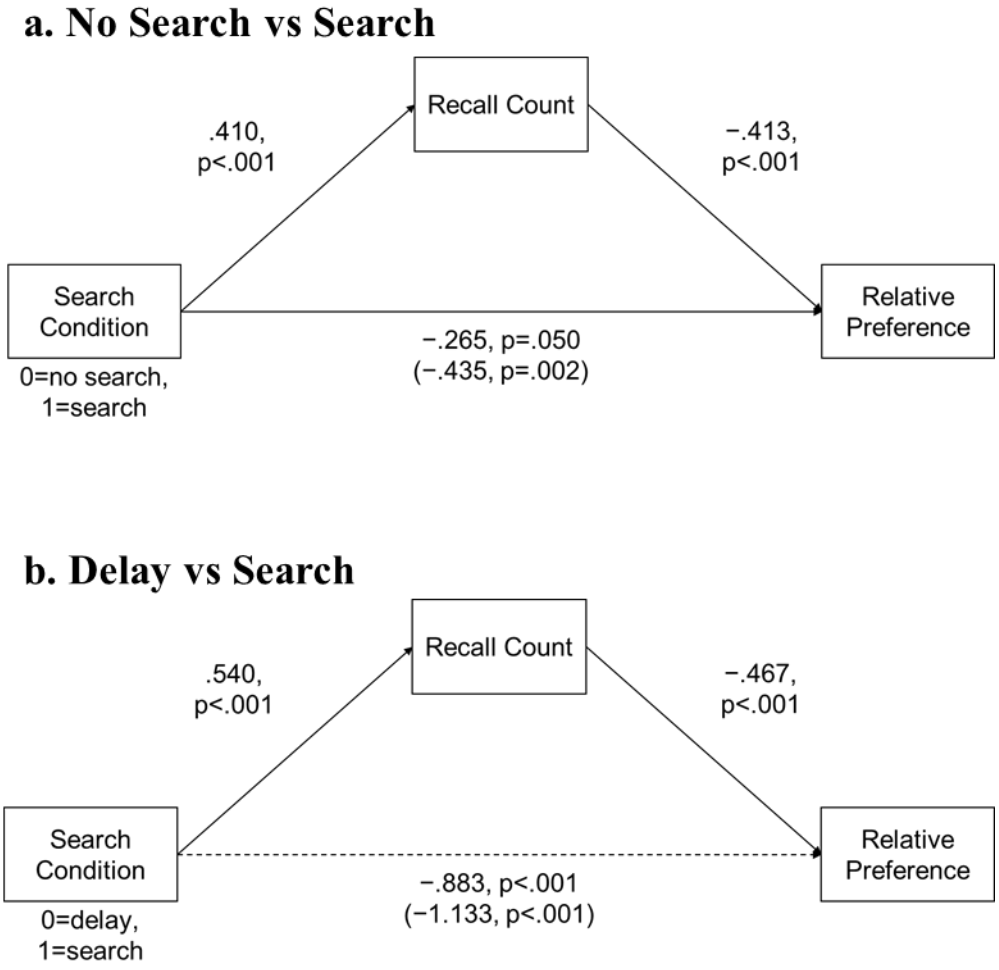

Figure 9. Mediation analyses for search vs no search (a), or delay (b) conditions (Study 4).

All three recall performance measures significantly predicted a lower preference for the focal drug disfavored by the searched attribute. The relative preference for Mosquirix was lower for those who did recall relevant information, $M = 3.37$, $SD = 1.63$, than those who did not, $M =$

4.53, SD = 1.57, $F(1, 893) = 117.79$, $p < .001$, $\eta_p^2 = .117$. Reverse-coded recall rank, $r = -.39$, $p < .001$, and recall count also predicted lower preference for Mosquirix, $r = -.34$, $p < .001$.

Mediation by Recall Performance. We tested the mediating role of accessibility for no search vs search, and delay vs search respectively. Recall count significantly mediated the impact of search (vs no search) on product evaluation (95% CI = −.09 [−.130, −.046]; Figure 9a), such that participants who searched recalled a greater number of relevant information bits, which subsequently predicted a lower preference for the drug associated with the searched attribute value. Recall count also significantly mediated the search effect on preference (95% CI = −.14 [−.238, −.049]). Mediation analyses comparing delay vs search yielded the same pattern of results for recall count (95% CI = −.25 [−.359, −.157]; Figure 9b) and recall rank (95% CI = −.38 [−.514, −.264]).

Discussion

Study 4 replicated the effect of goal-directed search on recall performance and product decision from Study 3. More importantly, we found support for H4. When search behavior does not take place, both the recall performance of the focal attribute and its post-search impact were lower compared to when participants did perform search. These results emphasize the critical role goal-directed search plays within our focal phenomenon.

The significant difference in relative preference between no search and delay conditions was not predicted ($d = -.70$, $p < .001$). Recall performance measures show that participants in the delay condition showed poorer recall performance on all three metrics than those in the no search condition. This raises the possibility that presenting a product attribute with a delay, in the absence of goal-directed search behavior, led to greater neglect of the focal attribute value associated with Mosquirix. Indeed, when we removed participants who either recalled side

effects value of Chloroquine (e.g., “upset stomach”) or pre-reveal Mosquirix (e.g., “no side effects”), there was a significant preference shift in the delay condition that brought it closer to the level observed in the no search condition (from $M = 4.52$, $SD = 1.55$ to $M = 4.18$, $SD = 1.58$, $t(518) = -2.46$, $p = .014$). The same preference shift was not significant in other conditions. Patterns of results for relative preference, recall performance, and mediation when comparing search and delay conditions were replicated after removing cases with aforementioned recall errors. We further discuss this result in relation to previous literature in Web Appendix D.

STUDY 5: VOLUNTARY SEARCH

The main purpose of pre-registered Study 5 was to test our main effect when participants voluntarily choose to search for a search target. In our previous studies participants were forced to search for the missing product attribute. This ensured that all participants in the search condition perform goal-directed search. However, some participants may have inferred that the target attribute is more important since they were instructed to search for it. Such inference would confer a greater decision weight to the focal attribute, resulting in the attribute having a larger impact on participants’ product decisions.

To exclude this alternative explanation, we conducted a modified version of Study 3, where participants in the search condition could voluntarily choose to search for the target attribute. In addition, the absence of target attribute values was not emphasized directly (i.e., missing attribute values from the product attribute table) to minimize demand effects. Finally, we simplified the search task to attenuate the difference in the amount of effort exerted by those in the search and no search conditions.

Method

Attribute Importance Pretest. We recruited N=1,334 Prolific participants to measure the importance of non-focal and focal attributes. The purpose of this pretest was two-fold. First, we aimed to examine whether attribute importance moderated our main search effect. Second, since those who consider the focal attribute as more important are also more likely to voluntarily search for it, we aimed to control for the attribute importance. We asked how important it was for them to know each of the four attributes to be used in the main study (ease of usage, effectiveness, use restrictions, and side effects of medicines) when they make a purchase decision with a 7-point scale. Most participants considered side effects—the focal attribute—as important (M=5.98, SD=1.20).

Main Study. Approximately 87% of pretest participants (N=1,172) returned to the main study. The study design was identical to Study 3 except for two critical differences. First, participants could advance to the final product decision page (with full information) without performing the search task. Second, instead of showing a blank space for the missing attribute, participants in the search condition saw a link that read "Side Effects Information" below the section with non-focal attribute information. Finally, the search task was simplified, so that participants only needed to select the names of the drugs they were considering. Those who only selected one drug at the first search attempt could choose to return to the search task to search for the focal attribute information of the remaining drug.

In summary, the search was completely voluntary, the absence cue of the missing focal attribute was more subtle to minimize the demand effect, and the difference in the amount of effort exerted by those in the search and no search conditions was attenuated compared to previous studies. As in Study 3, all participants performed a surprise recall task right after they stated their relative preference. Lastly, participants' prior experience of purchasing a malaria

drug and familiarity with malaria drugs presented in the study did not significantly influence our results and are not discussed further.

Results

Search Behavior and Attribute Importance. Among N=585 participants in the search condition, approximately 46% (N=267) performed a complete search of the focal attribute for both drugs, 51% (N=301) chose not to search, and 3% (N=17) did not perform complete search (only searched for the focal attribute of one drug). A one-way ANOVA showed that attribute importance was significantly different between these participants ($F(1, 1178) = 3.55$, $p = .014$, $\eta_p^2 = .009$). Tukey HSD test revealed that this difference was mainly driven by those who performed a complete search ($M = 6.18$, $SD = 1.12$) and those who chose not to search ($M = 5.87$, $SD = 1.27$, $d = 0.31$, $p = .010$). The same difference in attribute importance was not significantly different between participants who performed complete search and those in the no search condition ($M = 6.00$, $SD = 1.19$, $d = 0.19$, $p = .155$). We focus our analysis on participants in the no search condition and those who performed complete search.

Drug Evaluation. A one-way ANOVA revealed a significant difference in relative preference, $F(1, 852) = 15.01$, $p < .001$, $\eta_p^2 = .017$. Relative preference for the drug with worse focal attribute value was significantly lower for participants who performed complete search ($M = 3.21$, $SD = 1.68$) compared to those in the no search condition ($M = 3.69$, $SD = 1.64$).

Next, we investigated whether attribute importance affects the main search effect. Linear regression coefficients for the main search effect ($b = -0.44$, $SE = 0.12$, $p < .001$) and focal attribute importance ($b = -0.13$, $SE = 0.05$, $p = .006$) on relative preference were both significant. A separate moderation analysis showed that attribute importance did not moderate the main search effect on relative preference ($b = -0.04$, $SE = 0.11$, *n.s.*).

Recall Performance. We compared recall performance between participants who performed complete search and those in the no search condition. Chi-squared test showed that participants who performed complete search were more likely to recall relevant information (71.2%) than those in the no search condition (64.3%), $\chi^2 = 3.87$, $df = 1$, $p = .049$. Mann-Whitney U test revealed that participants who performed complete search (N = 267) had a smaller mean recall rank of 405.47 than those in the no search condition (N = 597) with a mean rank of 444.59. A statistically significant difference was found, $U = 72{,}483.00$, $Z = -2.20$, $p = .028$. Lastly, one-way Anova showed that recall count was not significantly different between those who performed complete search, $M = 1.15$, $SD = 1.14$ and those in the no search condition, $M = 1.16$, $SD = 0.31$, $F(1, 862) = 0.20$, *n.s*. In summary, participants who performed complete search showed superior recall performance in two out of three performance metrics.

As in previous studies, all three recall performance measures significantly predicted a lower preference for the focal drug disfavored by the searched attribute. The relative preference for Mosquirix was lower for those who did recall relevant information, $M = 3.40$, $SD = 1.62$, than those who did not, $M = 4.40$, $SD = 1.62$, $F(1, 1170) = 109.15$, $p < .001$, $\eta_p^2 = .085$. Reverse-coded recall rank, $r = -.35$, $p < .001$, and recall count also predicted lower preference for Mosquirix, $r = -.70$, $p < .001$.

Mediation by Recall Rank. Because recall count was not significantly different between participants who performed complete search and those in the no search condition, we tested the mediating role of accessibility for recall rank after treating it as a continuous variable. The indirect effect of complete search on preference via recall rank was significant at 90% CI = −.06 [−.115, −.004], but not at 95% CI level (90% CI = −.06 [−.124, .006]. This pattern of results held when the focal attribute importance was added as a covariate.

Discussion

The effect of goal-directed search on product decision was significant when participants voluntarily chose to search for a product attribute, suggesting that our previous findings were not solely explained by participants inferring greater importance of the focal attribute due to the forced nature of their search behavior. Attribute importance did predict whether a participant decides to search or not, but the non-significant importance difference between the no search condition and those who completed search suggests that, once goal-directed search takes place it influences product decision by increasing the impact of the searched attribute.

Recall performance was less consistent compared to Study 3 and 4. Participants who completed search showed superior recall of the focal attribute for only two out of three recall performance measures. Recall count between the no search condition and those who performed complete search were not significant, and the indirect effect via recall rank was only significant at 95% CI level. We attribute this to changes we made to the recall task, which was simpler compared to previous studies as participants only chose the names of target alternatives, and not the focal attribute category. Thus, the maintenance process during search involved weaker activation of the focal attribute (Hautekiet et al., 2024; Vergauwe & Langerock, 2017).

STUDY 6: FORCED VS VOLUNTARY CHOICE OF SEARCH TARGET

In pre-registered Study 6 we aim to bolster the robustness of our findings by comparing voluntary and forced choice of a search target. In our previous studies participants had only one target attribute to search, and thus, rendered the question of autonomous vs forced choice irrelevant. However, consumers often make a conscious choice about what product information to search for over others, either by necessity (e.g., size dimensions of a furniture to make sure it fits in one's room) or by strong preference (e.g., a spec of a computer component critical for

performance). Previous literature on autonomous choice shows that individuals confer greater value to an outcome that they pursued voluntarily (Botti & McGill, 2011; Zhang et al., 2011), whereas expending effort toward an imposed goal reduces its valuation (Zhang et al., 2011). This autonomy-based explanation predicts that goal-directed search will not increase, or even decrease the impact of the search target on a product decision when participants perceive that the search target was determined by someone else.

On the other hand, our accessibility explanation should be independent of this perception. If goal-directed information search behavior takes place, the target information must be maintained in one's working memory for the search to be successful. Forcing the search target may adversely affect its post-search impact due to its reduced valuation, but its accessibility would still be heightened compared to when no information search takes place. Therefore, we predicted that goal-directed search would increase the impact of the focal attribute on post-search decisions even when the target attribute was chosen by someone else (H5).

Method

Pretest for Selecting Search Targets. A pretest was conducted to address two potential issues when comparing autonomous vs forced choice of a search target. First, the focal attribute to be searched needed to be identical across conditions. Second, to avoid self-selection, we aimed to have the majority of participants granted the autonomous choice to choose the product attribute subject to our search manipulation. In order to accommodate these issues, we sought to select a focal product attribute with moderate importance, and a distractor attribute with low importance. This was to prevent a significant proportion of participants in the autonomous choice condition from choosing a different search target than the attribute chosen for participants in the forced choice condition.

We recruited 978 participants from Prolific for a pretest, of which 956 completed the key attribute ranking measures. Participants ranked ten product attributes in terms of their importance for evaluating meal kit companies. We chose "Nutritional Information" and "Friend Invitation Policy" ranked 5th and 10th on average as the focal attribute and distractor attribute respectively to be used in the main study. We invited participants who ranked the focal attribute at least three ranks higher than the distractor attribute (N=727) to the main study.

Participants and Procedure. The main study was conducted four days after the pretest. Six hundred twenty-two participants (58.4% female, M_{age} = 42.9) completed the study. Participants read that a university was in the process of selecting a meal kit provider for the school and was conducting a survey to collect public opinion on this matter. Participants were asked to review information about two candidate providers and choose one they prefer more.

Participants were randomly assigned to either "no search", "forced search target", or "voluntary search target" condition. Participants in the no search condition saw two meal kit provider names ("Gobble" and "Purple Carrot") and their full attribute values ("Diverse Dishes", "Portion Sizes", "Rich Visuals", "Packaging Quality", "Nutritional Information Disclosure"). The names of the two meal kit providers were counterbalanced; the counterbalancing factor did not significantly affect our analysis and is not discussed further.

Our focal attribute of interest was "Nutritional Information Disclosure" which favored one provider (target provider) over the other (non-target provider; Figure 10). After reviewing the information participants chose the provider they preferred.

No Search Condition

Gobble		Purple Carrot	
Diverse Dishes	8.0 / 10	Diverse Dishes	8.0 / 10
Portion Sizes	8.5 / 10	Portion Sizes	8.0 / 10
Rich Visuals	8.0 / 10	Rich Visuals	7.5 / 10
Packaging Quality	8.5 / 10	Packaging Quality	8.5 / 10
Nutritional Information Disclosure	7.0 / 10	Nutritional Information Disclosure	8.0 / 10

Search Condition

Gobble		Purple Carrot	
Diverse Dishes	8.0 / 10	Diverse Dishes	8.0 / 10
Portion Sizes	8.5 / 10	Portion Sizes	8.0 / 10
Rich Visuals	8.0 / 10	Rich Visuals	7.5 / 10
Packaging Quality	8.5 / 10	Packaging Quality	8.5 / 10
Third-Party Scores [1]		Third-Party Scores [1]	

[1] Scores provided by an external third-party institute.

Figure 10. Meal kit provider information for no search (up) and search (bottom) conditions.

The focal attribute value for both providers was missing for participants in the two search conditions. Instead, the attribute name was replaced by “Third-Party Scores” with no attribute values. Participants read that this score was “provided by an external third-party institute” (Figure 10). Participants in the voluntary search target condition could choose whether to search for the focal attribute or the distractor attribute. Participants who chose the distractor attribute (1.8% of participants in the voluntary search target condition) were instructed to search for the focal attribute purportedly due to data availability. We included responses from these participants in our data analysis. Participants in the forced search target condition also read that there are two potential search targets. However, they were told that although both search target attributes were available, they had to search for the focal attribute.

Then, participants in both search conditions advanced to the search instruction page. Participants were instructed to open a pdf file containing a five-page data sheet with columns labeled “Company Name”, “Company Address”, “SIC Code”, and “Nutritional Information

Disclosure Score" (focal attribute). Participants browsed the list to find the two providers (located on the 2nd and 5th pages respectively) being considered and their focal attribute scores. We instructed participants to record those scores in text boxes on the search instruction page. This was to identify whether a participant performed the search or not. Those who recorded values not attributable to the data sheet were removed from the analysis as per pre-registration (N=18). After the search was completed the full information for both providers (updated with nutritional information disclosure values) was presented and participants made the choice.

Results

Meal Kit Provider Choice. The choice share of the target provider (favored by the searched attribute) was significantly different across conditions, $\chi^2 = 12.62$, $df = 2$, $p = .002$. The choice share was the highest in the voluntary search target condition (62.4%), followed by the forced search target condition (55.0%) and the no search condition (45.1%; Figure 11).

We ran two binary logistic models to compare the effect size of goal-directed search between forced search target and voluntary search target conditions (vs no search, respectively), with the choice of the target provider coded as "1". As predicted, logistic regression coefficient of the search manipulation factor was significantly positive for both forced search target, $b = 0.40$, $SE = .20$, $p = .047$, and voluntary search target conditions, $b = 0.70$, $SE = .20$, $p < .001$. A planned contrast showed that the two regression coefficients were not significantly different in their effect sizes ($Z = 1.07$, one-sided $p = .143$).

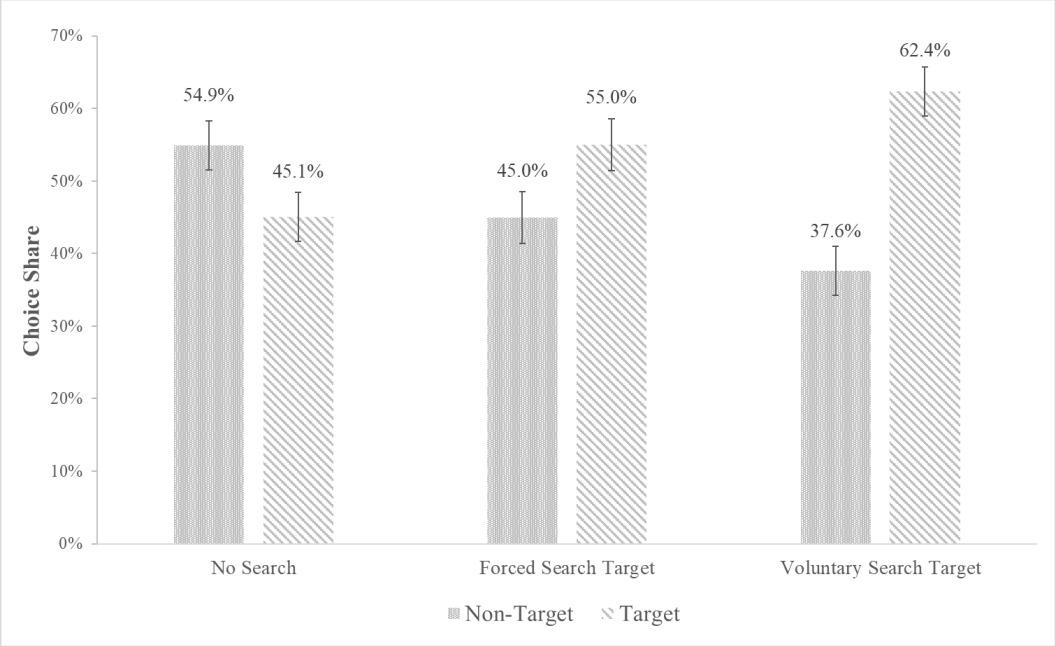

Figure 11. Meal kit provider choice shares.

Discussion

Results of Study 6 provide further support for the accessibility hypothesis. Heightened accessibility of the searched information follows the information being kept in one's working memory via conscious attentional focus—a process that takes place regardless of whether the search target was autonomously chosen or not (Hutchinson et al. 2016; Woodman and Chun 2006). In line with this explanation, the impact of the focal attribute on choice was significantly greater even when the search target was imposed (vs when it was not searched).

The size of our main effect was directionally greater when the search target was chosen autonomously than when it was imposed. This result has two important theoretical implications. First, it excludes dissonance as an alternative explanation for our finding. Cognitive dissonance theory would predict that participants in the forced search target condition confer greater importance on the searched attribute than those in the voluntary search target condition due to a greater need to justify their effort (Baumeister and Tice 1984; Stroud et al. 2019). However, our finding, albeit directionally, was the opposite of what dissonance theory would predict. Second,

it suggests the presence of effort effect. The impact of goal-directed search could be multifaceted, determined by both heightened accessibility of the searched attribute and effort expended for search. Depriving an autonomous choice of the search target may have resulted in devaluation of the attribute, subsequently decreasing its post-search impact (Zhang et al. 2011).

GENERAL DISCUSSION

Consumers often encounter decision environments where attributes such as hotel fees and taxes, shipping and handling fees (Brown, Hossain, & Morgan, 2010), university rankings (Luca & Smith, 2013), or nutrition information (Harr, 2017) are missing and require further search—a phenomenon widespread enough to incur public discontent and government interventions (Pohle, 2024; The White House, 2023). Our research provides a novel perspective into understanding this phenomenon by examining if and how such search behavior influences consumers' post-search product decisions.

We find when consumers search for missing attribute information, that information affects product decisions more than if it is provided upfront. One secondary data study and eight pre-registered experiments reveal this effect across different product categories, attribute valence, and search task types. Mediation analyses show the effect is explained by increased recall of the searched attribute, consistent with our accessibility explanation. Our findings demonstrate the critical role goal-directed information search plays, and suggest that alternative explanations such as delayed presentation, inference-making, recency effect, search effort, or dissonance do not fully account for our focal phenomenon.

Theoretical and Practical Implications

Our research contributes to the search literature by describing a new downstream consequence of information search. Previous research investigating antecedents of search often

considered the outcome of search as an "update" to consumers' product knowledge—a perspective deeply rooted in the literature. For example, the value of searching for information is "the amount by which it reduces the expected cost to the buyer of his purchases" (Stigler, 1961, p. 221), and search results in "revising utilities (of alternatives) in light of new information." (Meyer, 1982, p.96). Our research complements previous works on antecedents of search by highlighting what happens after the information is updated. Our findings suggest that one's decision to search a product attribute can further amplify how much the attribute influences product decisions—a consequence that would often not be evident nor intuitive at the time a search decision is made. In effect, our results underscore the relevance of consumers' information search behavior in predicting their post-search product decisions.

This research expands the existing literature on delayed presentation of product information. At first glance, previous research seems to provide mixed conclusions on this phenomenon. Santana, Dallas, & Morwitz (2020) finds that consumers are less likely to incorporate surcharge information into their product choice when the information is provided after an initial choice decision is made due to their misperceptions about the value of reconsidering their initial choice. In contrast, Ge et al. (2012) shows an attribute has a larger impact on the final choice when it is revealed after pre-choice screening is done due to greater decision weight being conferred on the attribute. Davis & Bagchi (2018) finds that a larger discount percentage can have a greater impact on product evaluation and purchase likelihood when it is sequentially presented after a smaller discount percentage due to its surprising nature drawing greater attention. These findings, in tandem with the results from Study 5, emphasize the need to consider the context in which delayed product information is acquired.

Our research also contributes to accessibility literature. Consumer behavior literature demonstrates a wide range of phenomena where accessibility of goals (Affonso, Janiszewski, & Bettman, 2020), naïve theories (Cho & Schwarz, 2008), or attitudes (Berger & Mitchell, 1989) influence consumer judgments and decision-making. We add to this literature by showing active information search increases attribute accessibility and its influence on product decisions.

We show accessibility is a main mechanism for this effect, but other factors likely contribute depending on the decision context. In Study 6 our main search effect was directionally greater when a search target was chosen autonomously (vs imposed; Zhang et al., 2011), suggesting that search effort plays a role in post-search preference outcomes (Anderson et al., 1979; Griffin & Broniarczyk, 2010). It is also possible that consumers may infer the importance of searched attributes based on their search behavior (Bem, 1967). However, such inference-making is more likely to take place when one's attitude toward the target of inference is uncertain (Fazio, Zanna, & Cooper, 1977). It is unclear whether product attributes meet this condition, since an attribute is a descriptive measure referencing product quality. As long as an attribute and its value are presented in an unambiguous manner, consumers would not hold an uncertain attitude toward it. Conversely, inference-making may play a larger role when consumers are uncertain about the meaning of an attribute.

Our findings provide implications about information search for consumers and managers. For consumers, understanding that deliberate search increases the influence of the searched information on their purchase decisions can help mitigate biases, leading to more accurate and satisfying purchases. For managers, our findings emphasize the importance of understanding where and how consumers obtain product information. Products are often marketed through multiple channels that differ in what product information is readily available or not (Degeratu,

Rangaswamy, & Wu, 2000; Glazer, 1991; Van Nierop et al., 2011). Therefore, consumers with similar preferences may engage in dissimilar search behaviors depending on the channel they use. A product attribute (e.g., customer reviews) that is readily available on one channel (e.g., online retailers) may incur extra search on another channel (e.g., department stores), resulting in heterogeneous impacts of a product attribute on purchase decisions. Managers can also tailor their promotion strategies to specific channels depending on which product attributes are more likely to require goal-directed search, subsequently having further positive or negative influence on consumers' purchase decisions. For example, price information on competing brands is often readily available on online channels, whereas the same information may require searching other stores in an offline setting (Alba et al., 1997). Therefore, the effectiveness of price promotions may be larger in offline channels where consumers obtain the information via search (Zhang & Wedel, 2009).

Our research provides practical insights for managers and policymakers regarding information disclosure practices. Because the amount of information that can be displayed to consumers is limited, companies often highlight positive product information while making negative information less accessible. However, this may lead to unintended consequences. If a significant portion of consumers are motivated to search for a less accessible negative product attribute, such product information disclosure would incur goal-directed search and further increase the negative impact from the attribute. Therefore, managers should consider not only what information to disclose but also what their target consumers are motivated to search for when developing their product information disclosure strategy.

Policymakers can also draw on our findings for implementing information disclosure regulations. Policies mandating upfront disclosure of negative product attributes (e.g., calories,

surcharges) aim to make necessary information more accessible for consumers to help them make informed decisions. Our findings suggest these regulations are most effective when consumers are already motivated to search for the target information. In such cases, mandating upfront disclosure can increase both consumer surplus (from reduced search cost) and sales (from increased purchase intent). Conversely, when motivation to search is low, such policies may unnecessarily restrict corporations with limited policy benefits. Indeed, prior research finds limited evidence that the mandated calorie labeling policy in fast food chains led to a reduction in the amount of calories purchased (Bleich et al., 2017), and that consumers' intent and awareness to use calorie information was an important predictor of lower calorie consumption (Brissette et al., 2013). Therefore, policymakers should consider not only the current accessibility of an attribute, but also consumers' motivation to search for it (Liu & Haws, 2023). Implementing mandated disclosure on cases where the gap between consumers' information demand and the low accessibility of a product attribute is most pronounced would maximize policy impact and benefit to consumers and sellers.

Limitations and Future Research

One limitation is that our search tasks were relatively short. For example, the median time spent on a search task was 23.2s in Study 3, or 30.4s in Study 4. Even in Study 6 where the search task was most burdensome, the median time spent searching was less than two minutes. This timeframe is indeed common in real life, such as searching for a vegan item on a restaurant menu or looking for an action movie at a theatre. However, there are other purchase situations that may involve longer searches, such as going through a list of customer reviews to find a specific comment on a product attribute or scanning a product warranty document to check for a specific policy. Longer search can increase the likelihood that consumers' attentional focus is

interrupted (Xia & Sudharshan, 2002), reducing consumers' processing capacity of the search target (Kang & Lakshmanan, 2017). Further investigation of our main effect in the context of longer search is certainly merited.

Another limitation is that we only examine successful search. Search may fail, and consumers may obtain product information only after multiple failed attempts (e.g., visiting multiple stores or websites). Failed search attempts increase anxiety (Menon & Dube, 2000) and elicit frustration during search (Reynolds, Folse, & Jones, 2006). These negative emotions can influence the encoding and recall of searched attribute (Wyer, Clore, & Isbell, 1999). In turn, the impact of the searched attribute may vary depending on its affective or semantic properties. Future research could investigate whether failed search moderates our main effect.

Future work could also explore the role of consumer knowledge (Alba & Hutchinson, 1987). More knowledgeable consumers can search more efficiently due to their superior understanding of product attributes and how much they contribute to quality (Rao & Monroe, 1988). Consumers more familiar with a product category can use their existing knowledge to limit their attention to most important attributes (Johnson & Russo, 1984). In turn, consumers who are more familiar with or have higher expertise of a product category may be less affected by a boost in accessibility of the searched attribute due to their greater reliance on their existing knowledge structure.

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WEB APPENDIX

Searching for Missing Product Attributes Increases Their Impact on Product Decisions

WEB APPENDIX A. STUDY 2 DATA SOURCE SELECTION AND DESCRIPTION

1. Data Source Selection

1) Candidate websites selection

We referred to two different sources to get a list of US-based online travel agency websites for consideration:

- US based travel companies ranking by market capitalization: Booking Holdings (Booking.com, Priceline.com, Agoda), Airbnb, Expedia Group (Expedia, Hotels.com, Vrbo, Travelocity, hotwire.com, Orbitz), Tripadvisor, Travelzoo (Statista; https://www.statista.com/statistics/1039616/leading-online-travel-companies-by-market-cap/)
- Top 10 Best Hotel Booking Sites 2024 (Top10.com): Booking.com, Expedia, Hotels.com, Kayak, Travelocity, Priceline, Orbitz, Trivago, Hotwire, HotelTonight (Top10.com; https://www.top10.com/hotel-booking-sites)

2) Target website selection criteria

Among the identified US-based travel agency websites, we narrowed down the target websites to use as data sources based on the following criteria:

- Remove any aggregator websites (websites that combine hotel products and reviews from origin websites).
- If multiple websites share the same review data, we chose the website with the highest US web traffic (based on Semrush; https://www.semrush.com/website/)
- We removed websites with too few hotel listings (excluding opaque or room-level listings) or too few reviews.

3) Target website selection results

We selected Expedia, Priceline, and Booking.com as our data sources.

US Traffic Ranking	Name	Included	Notes
1	Tripadvisor	No	Aggregator website
2	Airbnb	No	Online marketplace
3	Expedia	Yes	N/A
4	Booking.com	Yes	N/A
5	Kayak	No	Aggregator website
6	Priceline	Yes	N/A
7	Vrbo	No	Too few reviews & most of its listings were opaque or room-level listings
8	Hotels.com	No	Shares reviews with Expedia
9	Agoda	No	Shares reviews with Booking.com (some properties on the listing page display Booking.com review score when there are too few Agoda reviews)
10	Travelocity	No	Shares reviews with Expedia
11	Orbitz	No	Shares reviews with Expedia
12	Travelzoo	No	Too few listings
13	Hotwire	No	Shares reviews with Expedia
14	HotelTonight	No	Too few listings

2. Data Collection/Cleaning Details

We input the following itinerary settings—Las Vegas (NV), June 1st-3rd, 2024, 2 Adults—for all three target websites. Once the listings page loaded, we filtered the results to only include hotels then scrolled down until no more new listings were updated. At this point we used Listly (https://www.listly.io/), a browser-based text scraping app, and scraped the entire listing. The

text scraping outcome was cleaned by removing text other than hotel names, guest review scores, star ratings, base room rates and full price (if available). Then, we removed opaque listings (e.g., "1-Bedroom Suite at a 4⭐ Hotel") and room-level listings (e.g., "Amalz 2 Bedroom 3 Bathroom Balcony Suites at Mgm Signature !").

Next, we cross-checked the scraped hotel names from the three websites to identify listings with slightly different names. Hotel names were equated after confirming they had a similar name and the same address. Finally, we checked whether valid listings charged any junk fees or not by checking the origin website and recorded junk fee status accordingly (raw scraped data available on AsPredicted Research box (https://researchbox.org/3776&PEER_REVIEW_passcode=XUJYWX).

WEB APPENDIX B. SUPPLEMENTARY STUDY 1

In this study we aim to increase the generalizability of our findings. Specifically, we examine the effect of goal-directed search on a post-search decision using a different product category and attribute with positive valence. Participants make a binary choice, allowing us to test H1 in a choice context.

Method

We recruited 300 participants from Prolific (56.7% female, 40.7% male, 2.3% other, .3%, preferred not to state, M_{age} = 40.0) consistent with our pre-registration. Participants first read a cover story about choosing a restaurant for an event with their close friends and their family members including five kids. Participants learned they had narrowed their choice to two nearby restaurants and decided to look up review scores for the two options on a crowd-sourced review site. Participants were then randomly allocated to either the "no search" or "search" condition. In the no search condition participants saw names, sample photos, and four review score categories ("Atmosphere", "Food Quality", "Large-Group", and "Kid-Friendly") with full score values for each restaurant. Our focal attribute of interest was "Kid-Friendly" score, which favored our focal restaurant "Red Cow" over the other option, "George & The Dragon" (figure 5). After reviewing the information participants chose which restaurant they preferred for the event.

In the search condition, the "Kid-Friendly" attribute score was absent from the focal restaurant. Participants were clearly prompted that the attribute information was missing, and that they decided to search for this information to make an informed decision. Participants then advanced to the next page to perform a search task.

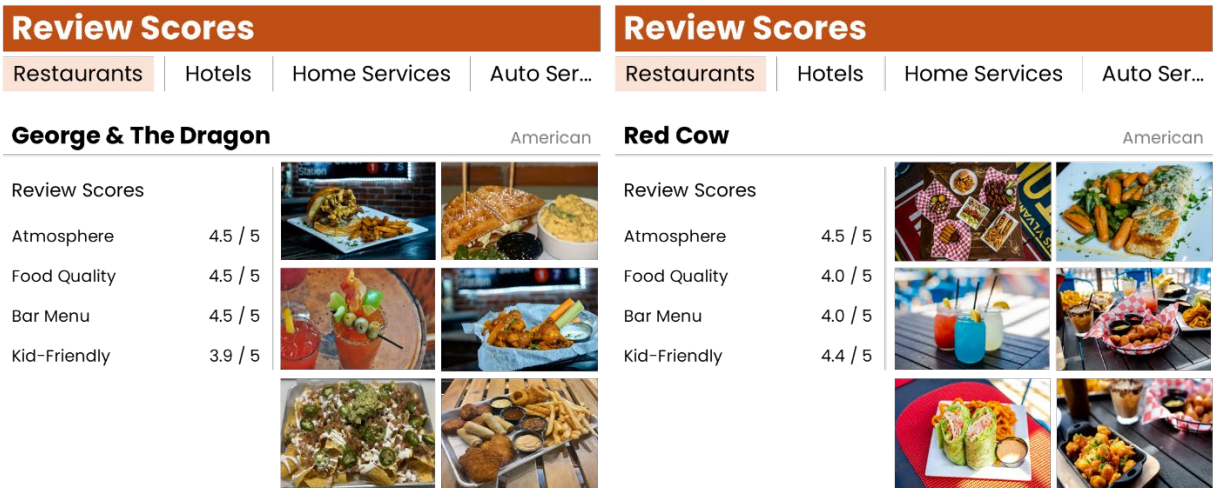

Figure 1. Restaurant information.

The search task required participants to maintain their search target for the duration of search via actions such as visually identifying and clicking the relevant product category ("Restaurants" header region), typing in the restaurant's name participants were searching for (Red Cow), and selecting the attribute category they would like to update (Kid-Friendly). Participants were instructed to return to the previous search stage when they made an irrelevant navigation decision. Upon successful search participants saw the "Kid-Friendly" score of the target option. Finally, participants proceeded to the next page where they saw the full list of attribute scores for both restaurants and then made their choice. That is, participants in both conditions saw the identical full information page before they made their choice.

Results

The choice share of the target restaurant (favored by the searched attribute) in the search condition was 65.3%, which was significantly higher than 53.6% in the no search condition (χ^2 = 4.26, df = 1, p = .039; Figure 1). This suggests that the attribute information had a greater impact on the choice when it was searched (vs not).

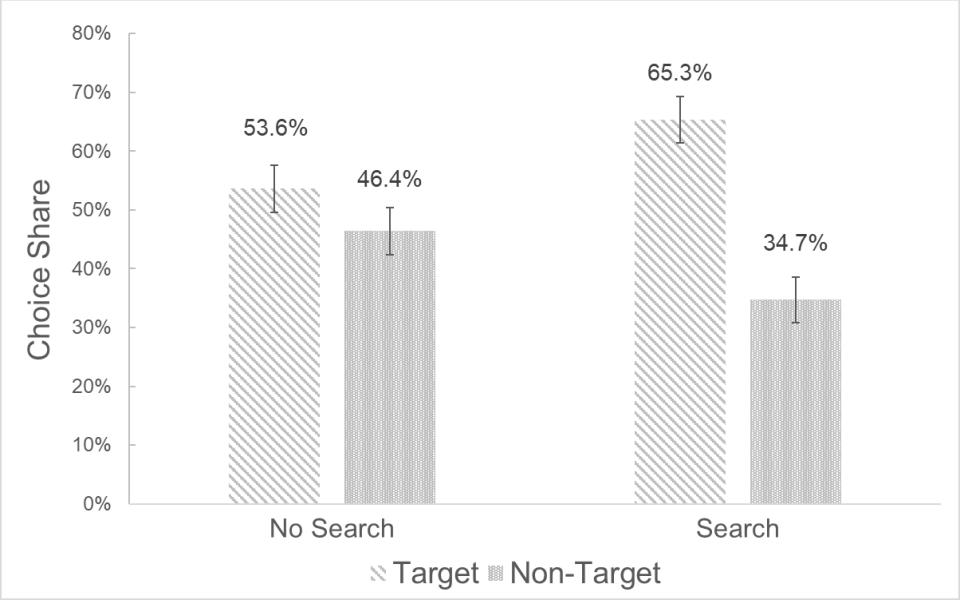

Figure 2. Restaurant choice shares.

Discussion

We found supportive evidence for H1 with a different product category-attribute pair in a choice context. In addition, the valence of the focal attribute was positive unlike in Study 1, suggesting that our proposed effect is not limited to negatively valenced product attribute such as price.

WEB APPENDIX C. STUDY 3 SEARCH TASK STIMULI

No Search Condition

	Bluetooth Speaker A	Bluetooth Speaker B
Sound	Stereo Sound Output 20W	Stereo Sound Output 16W
Playtime	24 hours 5,200mAh Li-ion battery	20 hours 4,500mAh Li-ion battery
Waterproof Rating	Can sustain: Sprays, light rain (IPX 3)	Can sustain: Sprays, light rain, swimming, heavy spray, shower, boat washing (IPX 6)
Weight	1.2 pounds	1.3 pounds
Price	$39.99	$39.99

Product Details

	Bluetooth Speaker A	Bluetooth Speaker B
Sound	Stereo Sound Output 20W	Stereo Sound Output 16W
Playtime	24 hours 5,200mAh Li-ion battery	20 hours 4,500mAh Li-ion battery
Bluetooth Version	5.4	5.4
Impedance	4 ohm	4 ohm
Frequency Response	70 hertz	70 hertz
Size	6.69 inches	6.75 inches
Weight	1.2 pounds	1.3 pounds
Waterproof Rating	Can sustain: Sprays, light rain (IPX 3)	Can sustain: Sprays, light rain, swimming, heavy spray, shower, boat washing (IPX 6)
Price	$39.99	$39.99

Search Condition

	Bluetooth Speaker A	Bluetooth Speaker B
Sound	Stereo Sound Output 20W	Stereo Sound Output 16W
Playtime	24 hours 5,200mAh Li-ion battery	20 hours 4,500mAh Li-ion battery
Waterproof Rating	**Check Product Details Below**	**Check Product Details Below**
Weight	1.2 pounds	1.3 pounds
Price	$39.99	$39.99

Product Details

	Bluetooth Speaker A	Bluetooth Speaker B
Sound	Stereo Sound Output 20W	Stereo Sound Output 16W
Playtime	24 hours 5,200mAh Li-ion battery	20 hours 4,500mAh Li-ion battery
Bluetooth Version	5.4	5.4
Impedance	4 ohm	4 ohm
Frequency Response	70 hertz	70 hertz
Size	6.69 inches	6.75 inches
Weight	1.2 pounds	1.3 pounds
Waterproof Rating	Can sustain: Sprays, light rain (IPX 3)	Can sustain: Sprays, light rain, swimming, heavy spray, shower, boat washing (IPX 6)
Price	$39.99	$39.99

WEB APPENDIX D. FURTHER DISCUSSION OF RESULTS FROM STUDY 5

This section elaborates upon the significant difference in relative preference observed between no search and delay conditions in Study 5.

Recall performance measures between no search and delay conditions were significant different for two out of three recall performance metrics. Chi-squared test showed that participants in the no search condition were more likely to recall relevant information (54.8%) than those in the delay condition (38.5%), $\chi^2 = 15.94$, $df = 1$, $p < .001$. Mann-Whitney U test revealed that participants in the no search condition (N = 301) had a smaller mean recall rank of 281.02 than those in the delay condition (N = 296) with a mean rank of 327.45, and the difference was significant, $U = 36{,}126.00$, $Z = -4.36$, $p < .001$. One-way Anova showed that recall count was directionally higher in the no search condition, $M = 0.74$, $SD = 0.90$, than in the delay condition, $M = 0.61$, $SD = 1.01$, $F(1, 595) = 2.72$, $p = .099$, $\eta_p^2 = .005$. These results, in tandem with a significant shift in preference in the delay condition when cases with recall error were removed, suggest that presenting an attribute with a delay, in the absence of goal-directed search behavior, resulted in greater neglect of the attribute.

This is in line with what Santana, Dallas, & Morwitz (2020) finds, where participants were more likely to disregard surcharge information when it was presented after they made their initial product decision (vs provided upfront). The authors attributed this effect to participants failing to accurately account for the newly revealed surcharge information, leading them to disregard the value of re-formulating their earlier decision. Our participants in the delay condition may also have made an evaluation of the two drugs while the focal attribute was initially missing, especially since they were told that additional information may become available later in a similar manner as in Santana et al. (2020). On the other hand, our results are

not in line with Ge, Häubl, & Elrod (2012) where a product attribute initially missing during the pre-screening stage had a greater impact on product decisions after it was revealed at the final choice stage. One critical difference in the decision context between Ge et al. (2012) and our Study 5 is the choice set composition. In Ge et al. (2012), participants first pre-screened two out of four options, then made their final choice between the two remaining options where a previously missing attribute value was presented. Therefore, the consideration set for the final product decision was different between the two choices. A change in the composition of a choice set, in tandem with newly revealed information, can inform consumers to use a different decision strategy (Bettman, Luce, & Payne, 1998, Payne, 1976), which may have increased the impact of the newly revealed attribute information. This was not the case in our study, where the focal attribute value was presented with a delay within the same choice set. Therefore, our participants may have felt less need to re-formulate their decision strategy, leading to relatively greater neglect of the focal attribute. While we cannot make a definitive claim on why the impact of the focal attribute was significantly poorer in the delay (vs no search) condition, our findings suggest a critical role a deliberate, goal-directed search behavior plays within our focal phenomenon.

WEB APPENDIX E. SUPPLEMENTARY STUDY 2

The main purpose of Supplementary Study 2 was to exclude recency effect as an alternative explanation. In previous studies participants in the search condition were first exposed to non-focal attributes (i.e., attributes they did not search) of alternatives. Then, they performed a search task and acquired focal attribute information. Therefore, some may argue that the impact of the focal attribute was larger in the search (vs no search) conditions because it was the last attribute to be exposed to participants. This is not technically true, as participants in both conditions were provided with the full set of product attribute information right before they made their product decision. But in an effort to address this recency-based explanation more directly, we reversed the order in which focal and non-focal attributes were exposed to participants. Stimuli from Study 4 were used to examine both product decision and recall performance.

Method

We recruited N=650 from Prolific (49.4% female, 49.2% male, 1.4% other, M_{age} = 41.1). Study design and stimuli were identical to Study 4 except for how focal attribute was presented in the search condition. Unlike in Study 4, participants in the search condition only saw the focal attribute (side effects), and that its value for Mosquirix was missing. Non-focal attributes and their values were presented only after participants performed the search task, right before participants made their product decision. This reversed the order in which focal and non-focal attributes were exposed to participants in the search condition, with non-focal attribute being presented for the first time after focal attribute value was presented. We also administered the same surprise recall task after product decision was made to examine whether the change in the order of presentation influenced participants' recall performance as well.

Results

Drug Evaluation. A one-way ANOVA revealed a significant difference in relative preference of drugs between conditions, $F(1, 649) = 12.73$, $p < .001$, $\eta_p^2 = .019$; relative preference for the focal drug associated with worse side effects was lower for participants who searched the information ($M = 3.46$, $SD = 1.81$) compared to those who did not perform the search ($M = 3.97$, $SD = 1.79$). The main search effect held when prior experience of purchasing malaria drugs or familiarity with either drug was included as a moderator.

Recall Performance. Participants in the search condition (N = 327) had a lower mean recall rank of 294.16 than those in the no search condition (N = 323) with a mean rank of 357.23. A statistically significant difference was found, $U = 42{,}563.00$, $Z = -4.51$, $p < .001$, indicating that relevant information was recalled sooner in the search condition. One-way Anova showed that recall count was higher for those who searched, $M = 1.24$, $SD = 1.41$, than those who did not, $M = 0.91$, $SD = 1.30$, $F(1, 649) = 9.30$, $p = .002$, $\eta_p^2 = .014$, indicating more relevant information was recalled in the search condition. Lastly, chi-squared test showed that participants in the search condition were more likely to recall relevant information at all (61.2%) than those in the no search condition (50.5%), $\chi^2 = 7.54$, $df = 1$, $p = .006$. These results suggest that the focal attribute information was more accessible when it was searched (vs not searched).

All three recall performance measures significantly predicted a lower preference for the focal drug disfavored by the searched attribute. Earlier recall (reverse-coded recall rank), $r = -.31$, $p < .001$ and recall count predicted a lower preference for Mosquirix, $r = -.21$, $p < .001$. Relative preference for Mosquirix was lower for those who did recall relevant information, $M = 3.35$, $SD = 1.78$, than those who did not, $M = 4.18$, $SD = 1.76$, $F(1, 649) = 35.54$, $p < .001$, $\eta_p^2 = .052$.

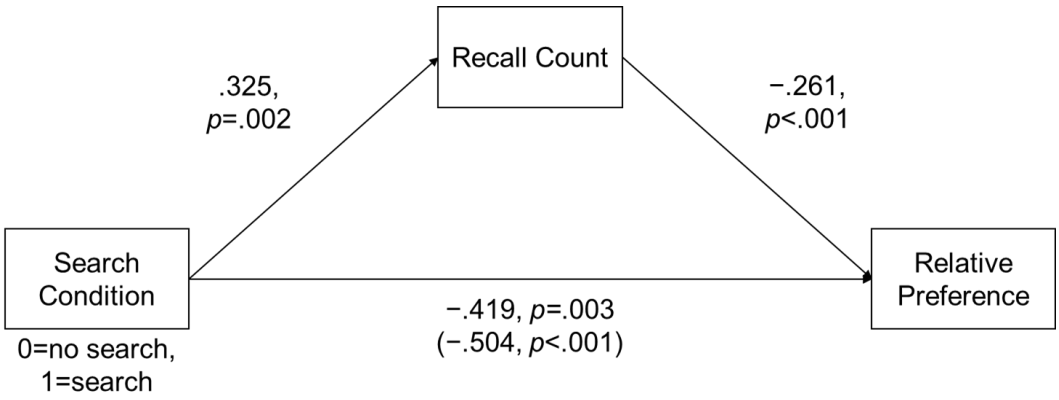

Figure 3. Mediation analysis (Supplementary Study 2).

Mediation by Recall Count. We conducted a mediation analysis using 5,000 bootstrapping draws (Hayes 2017; model 4), with search manipulation as the IV, product evaluation as the DV, and recall count as the mediator. A significant indirect effect was found (95% CI = −.08 [−.163, −.025]). Participants who performed goal-directed search for the side effects attribute recalled a greater number of relevant information bits, which predicted lower preference for the drug associated with the searched attribute (Figure 3).

Discussion

The results on both relative preference and recall performance measures were replicated with the focal attribute value being presented before non-focal attributes. Furthermore, participants in the search condition displayed comparable recall performance to that of Study 4. Mean recall ranks were 294.16 (Supplementary Study 2) vs 289.13 (Study 4), recall counts were 1.24 (Supplementary Study 2) vs 1.14 (Study 4), and proportion of participants who recalled relevant information was 61.2% (Supplementary Study 2) vs 72.8% (Study 4). That is, participants showed similar recall of the focal attribute regardless of whether the focal attribute was presented before or after non-focal attributes if the search behavior took place. These results, in tandem with the significant search effect observed in this study suggest that recency explanation cannot fully account for our previous findings.