The Priming Effects of Relevant and Irrelevant Advertising in Online Auctions

Alan R. Dennis  
Indiana University  
ardennis@indiana.edu

Lingyao (Ivy) Yuan  
Indiana University  
yuanl@indiana.edu

Xuan Feng  
Indiana University  
xuanfeng@indiana.edu

Aleesha P. Hedge  
Indiana University  
aphedge@indiana.edu

Eric M. Webb  
Indiana University  
ermwebb@indiana.edu

Christine J. Hsieh  
Indiana University  
chjhsieh@indiana.edu

Abstract

Individuals’ bidding behavior in online auctions has been the subject of research in multiple disciplines. Most prior bidding research has focused on deliberate rational cognition, yet recent research in psychology suggests that much of human behavior is influenced by non-conscious automatic cognition. One technique that has been shown to influence non-conscious cognition is priming, the presentation of stimuli intended to activate certain concepts in working memory prior to the task of interest. In this paper, we develop a new form of priming, which we call concurrent priming, in which the stimuli are delivered during the task itself. We conducted three experiments to investigate the impact of concurrent priming delivered through what appeared to be advertisements on individuals’ willingness to pay in online auctions. We found that the priming advertisement significantly influenced the bid amount but the impact was reduced when the product had a manufacturer’s suggested retail price.

1. Introduction

Online auctions have been one of the greatest successes in electronic commerce [9]. eBay, the largest online auction website, currently has more than 100 million active users worldwide. According to Forbes, in 2012, more than 75 billion dollars’ worth of products were traded on eBay and this number will double over the next six to seven years [36]. Online auctions are widely used for both new products and the resale of used and collectable items whose value is harder to assess [17]. The rapid growth of auctions, and their popularity, makes them an important marketplace that is expected grow [31, 39]. Understanding the factors that influence consumer behaviors in online auctions, especially their bidding behavior, is thus an issue of both theoretical and practical significance.

Many factors affect a consumer’s online bidding behavior, such as price, product value, product image, the number of competing bidders, and satisfaction with previous purchases [3, 35, 40]. Prior online auction research has focused on the rational aspect of bidding behavior [3]. Yet, current psychology research shows that much of human behavior is guided by non-conscious cognition [7, 22, 23]. The question is, can online auctions be designed to deliberately shape non-conscious cognition to influence the amount that potential buyers bid?

We conducted three lab experiments to examine the impact of priming (the presentation of stimuli intended to activate certain concepts in working memory) delivered through irrelevant and relevant advertisements on individuals’ willingness to pay in an online auction. Our results show that individuals will place a higher bid on a product that lacks a clear value when exposed to an advertisement with a high price and a lower bid when exposed to low price advertisement regardless of whether the advertisement is relevant to the product or not. However, when the product has a clear value (as indicated by a manufacturer’s suggested retail price) advertisements for relevant products influenced bids but advertisements for irrelevant products did not.

2. Theoretical Background

2.1 Online Auctions

Online auctions have become increasingly popular, enabling consumers to purchase goods from both businesses and individual sellers [5]. The name-your-own-price mechanism has also given consumers more pricing power. In this environment, understanding consumers’ willingness to pay has become key to business success [1, 4, 5, 20].

Previous research on rational choice theory shows that bidding behavior is influenced by product information, pricing and the auction system itself [13, 29, 30]. The amount a consumer bids is a function of the consumer’s perceived value of the product [28]. In some cases, perceived value is indicated by signals in the marketplace, such as the manufacturer’s suggested retail price (MSRP) [26]. Many consumer products
have a clear MSRP (e.g., cameras, cars, TVs), which serves as one indicator of value, although the actual price a consumer pays may differ from MSRP depending where and how a product is purchased. In other cases, products have no MSRP (e.g., used items, collectibles, original artwork), so determining value is more difficult.

Most prior research is based on rational choice theory, which assumes that an individual acts rationally to balance costs against benefits to maximize personal advantage [13, 29, 30]. Factors such as product information, product image, pricing strategy [12, 37], and system design have been found to influence individuals’ willingness to pay and bidding behavior. Researchers looked into the effect of product review on price and suggest separating perceived value from perceived quality as a strategy to control impact of product review [25]. It is also found that increasing the quality of an auction business's e-image increases the prices received at the auction and individuals' willingness to transact with the business [18]. Not only product specialization, but non-contractible elements, including non-contractibility—quality, supplier technological investments, information exchange, responsiveness, trust, and flexibility, of inter-organizational relationships also have great explanatory power for reverse auction use [27]. Implementing information feedback to the auction system is also found to increase the amount of successful trading on the auction websites because it helps build trust, which is critical in electronic auctions [1, 2, 5].

Prior research has even found that users' levels of online auction addiction have an impact on their reasoned IT usage decisions through altering users' belief systems [38]. Researchers also have looked into the perception formation in sequential online auctions [16]. However, most of the research on electronic auctions has been built on an assumption that consumers make rational decisions. Behaviors resulting from or impacted by other factors have not caught the attention or interest of most researchers.

Individuals possess a limited cognitive capability and are not motivated to expend a lot of cognitive effort all the time [32]. An auction environment provides the consumer with a large amount of information about the competing products, resulting uncertainty in the decision making process [39]. The theory of rationality implies that individuals have infinite cognitive processing capabilities and can make decisions on assessing all aspects of all alternatives provided, rationality [13, 29, 30]. Some researchers also emphasize the cognitive constraints of individuals in individual's decision making process. Most individuals' decisions are also influenced by intuition to reduce the cost of deliberation [14], which indicates that online auction decisions are often non-rational. However, there is little prior literature on the non-rational aspect of online auction decision-making.

2.2 Priming

Priming is the presentation of stimuli designed to activate internal mental representations of desired concepts in working memory in an attempt to influence subsequent behavior [8]. Previous research shows that priming can influence such disparate individual behaviors as politeness or rudeness, performance on SAT tests [15], and consumption of snack food [19].

There are two predominant ways to deliver a prime: subliminal (“below threshold”) and supraliminal (“above threshold”). Subliminal priming involves brief presentation of a stimulus followed by a perceptual mask [8]. In subliminal priming the stimulus is presented quickly and the participant is not consciously aware of that stimulus. In contrast, in supraliminal priming, the participant is consciously aware of the stimulus, but the participant is not aware of the intent behind it. Common ways of delivering supraliminal priming include word games, images, and videos [6, 10, 34, 41]. The common feature in both subliminal and supraliminal priming is that the participant remains unaware that the stimulus is activating internal mental representations and his or her behavior is affected because priming acts through non-conscious cognition [8].

Prior research on priming has delivered the priming stimulus before the actual behavior of interest – this is why the technique is called “priming” [7]. Priming is effective in lab settings because participants typically are asked spend 5-10 minutes giving their attention to the stimulus, prior to engaging in the task. This is quite appropriate given the controlled environment of most research labs. However, imagine asking a participant in an online auction to devote 5 minutes to a priming stimulus prior to bidding. Not exactly practical. We need a new form of priming that does not require auction buyers to spend time prior to bidding for the priming to be effective.

2.3 Concurrent Priming as Advertising

In this paper we develop a new form of priming that we call concurrent priming. With this form of priming, the priming stimulus is delivered concurrently with the task. Rather than requiring participants to focus on the priming stimulus and then perform the task, the priming is presented on the same screen as the task itself.

The advantage of this approach is that it is readily applied to an online environment such as online auctions. The task is online and the stimulus can be designed to appear on one part of the screen as the user
performs the primary task (shopping and bidding on a product). The user doesn’t need to take time to focus on the stimulus prior to performing the task.

Concurrent priming is likely less powerful than traditional priming for exactly this same reason. Because the user is not required to focus on the stimulus, there is no guarantee that the user will actually engage with the stimulus. Because it is presented beside the primary task, the user may simply ignore it. Even if the user does focus on the stimulus, it may require using cognitive resources to process it, resources that must be directed away from the shopping task. However, prior research suggests that individuals do not need to consciously process a stimulus in order for a concept to be activated in working memory [11]. Priming stimuli presented in the visual field can influence behavior even if the individual does not recall their content [11].

So how can we present priming stimuli on the same screen as an auction in a manner that appears natural to potential users? We chose to use advertisements. We designed an online auction website that presented advertisements to deliver concurrent priming to participants. Using this tool, we conducted three experiments to investigate the impact of concurrent priming on individuals’ bidding behavior.

3. Study 1: Products with Unclear Value

The amount a consumer bids for a product is a function of his or her perceived value of the product [3]. Some products have a value clearly ascribed to them in the marketplace (e.g., a MSRP), which may or may not match the consumer’s perception of value, but is still likely to influence bidding behavior [33]. Other products do not have a clear value (e.g., those without a MSRP). Our first study examines the effects of priming when the value of a product is unclear because we believed that priming is likely to have the strongest effect when the value of a product is not clear.

We argued above that online bidding behavior is affected by both deliberate rational cognition and non-conscious automatic cognition [13, 22, 29]. One deliberate, rational cognitive process that can be invoked when the value of a product is not clear is a search for information that suggests a value for the product [33]. For example, bidders may look at the value of comparable products and use those values to help determine the value of the product they are bidding on [24, 33].

Thus, an advertisement that presents a similar product to the target product being shopped for and suggests a value for the similar product provides relevant information to the consumer, information that may be used by a deliberate, rational cognitive process to help determine an appropriate bid for the target product. We theorize that price stated in an advertisement for a similar product (one that is relevant to the target product) will influence the value that a consumer ascribes to the target product and thus the amount that the consumer bids. When exposed to advertisements for higher priced relevant products, individuals will bid higher than when they are exposed to advertisements for lower priced products.

But this is only half the story; non-conscious automatic cognition is also at work. Suppose an advertisement for an unrelated product is presented (e.g., an advertisement for a bicycle when you are shopping for a camera). With deliberate, rational cognition, the price of the unrelated product should have no impact on the valuation of the target product.

But is automatic non-conscious cognition influenced by the price of the irrelevant product? Research in psychology suggests that with limited cognitive resources, individuals only have “bounded rationality” and thus their decision making are influenced by non-conscious factors [22].

The part of the brain responsible for non-conscious cognition is always active and processing external stimuli [21, 22]. Whether you want it to or not, non-conscious cognition processes external stimuli, loads them into working memory and presents conclusions based on them [23]. One may attempt to deliberately avoid the conclusions from non-conscious cognition but this is harder than one would anticipate because we are usually unaware of them [23, 29]. The best approach is to avoid the external stimuli that trigger non-conscious cognition, but induce stimuli that are barely noticed (or even not noticed) by our conscious cognitive processes yet still influencing non-conscious cognition [7].

Therefore, we theorize that the price of an irrelevant product advertisement will influence the amount a consumer bids. Whether the conscious cognitive process that assesses the value of the target notices or not, non-conscious cognition will process the stimuli present on the screen and use them to suggest a value for the product. Individuals may or may not be consciously aware of the price of the irrelevant product, but their non-conscious cognition will see it and automatically use it to suggest a value for the target product, even though this value is completely irrelevant to the product’s actual value.

One important question is the extent to which the consumer’s deliberate rational cognition about how much to bid is influenced by the irrelevant value presented by his or her non-conscious cognition. We hypothesize that the deliberate rational cognitive process that determines how much to bid will be influenced in a meaningful way by non-conscious cognition.

This leads to our two hypotheses. In this first experiment, we examine the effects of concurrent
priming delivered through advertisements for relevant and irrelevant products on the consumer’s online auction bidding behavior. We argue that both deliberate rational cognition and non-conscious cognition will use the information contained in a priming advertisement to influence the amount bid. Thus, we hypothesize that

H1: Individuals will bid more when exposed to a high priced advertisement than when exposed to a low priced advertisement.

Relevant advertisements should evoke both rational and non-conscious cognitive processes. We believe rational cognition processes are more salient than non-conscious cognition processes and thus will have a stronger impact on bidding behavior. Thus advertisements for relevant products, which are used by both rational and non-conscious cognitive processes, should have a stronger impact on the amount bid than irrelevant advertisements which are used only by non-conscious processes. Thus, whether the priming advertisement presents a related or unrelated product will moderate the relationship between the price of the advertised product and the amount bid. Therefore:

H2: Advertisements providing the price of related products will have a stronger effect on the amount bid than advertisements for unrelated products.

3.1 Method
3.1.1 Participants. Seventy-three undergraduate students taking an introductory business course at a large US public university participated in the experiment. Their average age was 19.5 years; 57% were male. All participants received extra credit for participating.

3.1.2 Task. The task was an online shopping task modified from [41]. The task asked participants to imagine themselves as a new student in a new master program in the business school, Master of Science in Graphic Design (MSGD). To take courses in this program, students needed to purchase two products (a camera and a laptop) from the auction website provided. The task instructions provide minimum configuration requirements as well as recommended configurations. Professional cameras were chosen as one of the bidding product categories because it is not a common technology device for business majored undergraduate students. Thus, the prices of a professional camera is believed to be unclear to the participants. Despite the fact that laptops are common to students and that the reference prices for laptops are easily accessible, the price range of a laptop is very wide depending on its brand, model, etc. In this experiment, we used four brands, Dell, Acer, HP, and Toshiba. These four brands have many product models with wide price ranges. Therefore, the price for a specific model of any major laptop brand is believed to be unclear to the participants.

For each product category (cameras or laptops), five products were provided to choose from. All products in the same category had the same color and appearance to avoid the effect of appearance on participants’ bidding behavior. Participants were presented with product descriptions, brand descriptions, rating reports, and detailed test results. Product descriptions and brand descriptions were adapted from Amazon.com. Rating reports and detailed test results were adapted from Consumer Reports. Participants were required to bid on one and only one product from each category. An example of the experiment screen is provided in Figure 1.

3.1.3 Treatment. This study follows a 2 (relevancy of advertised product: relevant vs. irrelevant) × 2 (price of the advertised product: high vs. low) design. Participants were randomly assigned to one of the two product relevancy treatments (a between-subjects factor) and both price treatments (a within-subjects factor). As seen in Figure 1, the advertisement is provided on the right side of the screen, thus, allowing for concurrent priming.

The relevancy of the advertised product is manipulated through the closeness of the advertised product to the bidding product. A relevant advertisement is an advertisement for a product in the same product category as the bidding product; for example a camera when the subject was buying a camera and a laptop when he or she was buying a laptop. An irrelevant advertisement advertised a product that was in a very different product category as the bidding product. We choose to use a bicycle as the irrelevant product. Rationally, any information provided in the bicycle advertisement should not be taken into consideration during bidding for cameras or laptops.

The price of the advertised product was manipulated through its dollar amount in the advertisement. The low priced advertised product was set at $650. The high priced advertised product was set at $950. Both prices were selected to be in the range of reasonable prices for cameras and laptops.

3.1.4 Dependent Variable. The dependent variable for this study was the subject’s willingness to pay for each product; that is, the amount the subject bid for the product. To control for the effect of different prices for different product categories, we standardized the bid.
amounts within each product category (i.e., used the z-score).

3.1.4 Control Variables. We measured the participants’ product knowledge with two sets of four Likert scale items, one asking about knowledge of laptops (alpha=.83) and one about knowledge of cameras (alpha=.83). We found no significant differences in the laptop knowledge (F(1,71)=1.25, p=.268) and camera knowledge (F(1,71)=3.74, p=.057) between the participants assigned to the relevant or irrelevant product treatments. We also examined whether product knowledge influenced the amount bid and found no significant main effects or interest effects for both camera and laptop knowledge.

3.1.6 Procedure. After arriving at the laboratory, subjects were given two minutes to read the task. They were then shown a brief demonstration of the website. Participants were asked to shop for the first product, either a laptop or camera (randomly selected) and record their bid amount. Participants’ product knowledge were measured through a questionnaire. They then shopped for the second product and recorded their bid amount. They then completed a short demographic questionnaire and were dismissed.

3.2 Results

Statistical analyses were completed in SPSS 19.0 using repeated-measures generalized linear model (GLM). The results are presented in Table 1.

There was a significant main effect for the price of the advertised product (F(1, 24.973), p = 0.000), and a significant interaction effect between the price of the advertised product and product relevancy (F(1,16.532, p = 0.000). There was no significant effect due to treatment order (F(1, 0.001, p = 0.971)) or product order (F(1, 2.076), p = 0.154). Participants bid higher with a high priced advertisement and lower with a low priced advertisement. Thus, H1 was supported.

Participants bid significantly higher and lower when exposed to relevant advertisement than when exposed to irrelevant advertisement. Thus, H2 was supported. The effect size is large for relevant advertising (1.13) and small for irrelevant advertising (0.12). Given the noticeably different effect sizes for relevant and irrelevant advertising, we decided to examine their effects separately in the subsequent studies.

4. Study 2: Relevant Advertising for Products with a Suggested Value

Some products have a value suggested by the marketplace, often in the form of a MSRP. The MSRP serves as a critical information point and is often incorporated in the bidding decisions using deliberate rational cognition. Many individuals in an online auction view the MSRP as the ceiling price for a product, believing that in an auction they should not bid more than this price. Thus, the MSRP serves as an anchor for product valuation. The effects of advertising should be weaker, because both deliberate rational cognition and non-conscious cognition act upon MSRP, as well as the price of the advertised product. The consumer now has two prices vying for his or her attention (MSRP and the price in the advertisement) so the impact of the advertised product’s price should be less.

In this study, we look at the impact of an advertisement for a relevant product when an MSRP is provided. As we argued before, the concurrent priming delivered through relevant advertisement invokes rational cognition and non-conscious cognition. Both should act to influence the amount bid. The question is, will the price of a relevant product influence the amount bid for the target product in the presence of a MSRP. We hypothesize:

H3: In the presence of a MSRP, individuals will bid more when exposed to a high priced relevant advertisement than when exposed to a low priced relevant advertisement.

4.1 Method

4.1.1 Participants. Thirty five undergraduate students from the same participant pool as Study 1 participated in this experiment. Though these students are from the same pool, no student participated in more than one study. The mean age was 19.5 years; 77% were male. Participants received extra credit.

4.1.2 Task. The task was the same as in Study 1, except that each product provided a MSRP, which ranged from $964 to $999.

4.1.3 Treatment. This study had two treatments: high priced and low priced advertisements. All advertisements in this study were relevant advertisements as described in Study 1. Subject received both treatments in random order as they bid on a camera and a laptop.

4.1.4 Dependent Variable. Participants’ willingness to pay was calculated as the percentage of the participant’s bid amount divided by the selected products MSRP, to control for the different MSRP across the products. We used very slightly different MSRP to make the study appear realistic (if all products had the same MSRP it would have appeared suspicious), but we did not include MSRP as a deliberately manipulated variable of interest in the study. As in Study 1, we standardized the percentages within products (i.e., z-score).
4.1.5 Control Variables. The control variables were the same as in Study 1 and once again they had no significant effects.

4.1.6 Procedure. The procedures were the same as in Study 1.

4.2 Results

The main effect for the price of advertised product was significant (F(1, 4.511), p = 0.041). There was no significant effect of treatment order (F(1, 0.167, p = 0.685)) or product order (F(1, 0.709, p = 0.406). The results are presented in Table 2. The effect size is 0.33. H3 is supported.

Results show a difference in bidding price given a high or low priced advertisement. In the presence of a MSRP, participants bid about 5% ($50) higher when shown a high-priced advertisement than when shown a low-priced advertisement. Thus, H3 was supported.

5. Study 3: Irrelevant Advertising for Products with a Suggested Retail Price

Study 2 showed that even in the presence of a MSRP to signal a potential value for a product, advertising a relevant product influenced the amount bid in an online auction. Study 2 only examined the concurrent priming effect of relevant advertisements. Study 3 examines the concurrent priming effect of irrelevant advertisements.

Under deliberate, rational cognition, irrelevant advertisements provide no information about the value of a product for the bidding task and thus should not be taken into account. However, Study 1 showed that they did have an impact, suggesting that non-conscious cognition acted on the irrelevant information in the advertisements to influence the amount bid.

The question here is whether non-conscious cognition will still influence bidding when products display a MSRP as one indication of the value of the product. We would expect the effect of the irrelevant advertisements to be considerably weaker when a value anchor such as MSRP is present because it will influence deliberate rational cognition. MSRP should also influence non-conscious cognition in the same manner as the price in an advertisement: it is another number that non-conscious cognition can recognize and present to the conscious process as a possible value. Thus non-conscious cognition will be influenced by both the MSRP and the price in the advertisement, thus weakening the impact of the price in the advertisement on the bid amount. We argue there will still be an impact of the price of the irrelevant product. Thus, we hypothesize that,

H4: In the presence of a MSRP, individuals will bid more when exposed to a high priced irrelevant advertisement than when exposed to a low irrelevant priced advertisement.

5.1 Method

5.1.1 Participants. One hundred and ninety-six undergraduate students from the same participant pool as Study 1 and 2 participated in this experiment. Though these students are from the same pool, no student participated in more than one study. The mean age was 19.5 years; 63% were male. All participants received extra credit for participating.

5.1.2 Task. The task was the same as Study 2.

5.1.3 Treatment. This study had two treatments, high priced and low priced advertisements for an irrelevant product (a bicycle). Subjects received both treatments in random order as they bid on a camera and a laptop.

5.1.4 Dependent Variable. Similar to Study 2, the dependent variable was calculated as the percentage of the participant’s bid amount to the manufacturer’s suggested retail price. These were standardized by product (z-score).

5.1.5 Control Variables. The control variables were the same as in Study 2 and once again they had no significant effects.

5.1.6 Procedure. The procedure was the same as Study 2.

5.2 Results

The main effect for the priming (F(1, .379), p = 0.539) was not significant. See Table 3. H4 was not supported. The power was 0.84 to detect a small effect size.

In the presence of an anchor indicating product value (i.e., MSRP), an irrelevant advertisement no longer impacted the consumer’s bid amount. Thus non-conscious cognition, when presented with two possible anchor values (MSRP and the price of an irrelevant product), no longer used the irrelevant price to influence deliberate rational cognition. Thus, H4 was not supported.

6. Discussion

Taken together, these three studies offer evidence that consumer bidding behavior in online auctions can be influenced by priming delivered via advertisements during the bidding process. By subtly changing the design of a website, we can change the amount a consumer is willing to pay.

Study 1 shows that when the value of a product is unclear, the price displayed in an advertisement presented at the same time influences the amount bid. This priming effect is stronger when a relevant product is advertised but it still exists for an irrelevant product.
(e.g., the advertised price of a bicycle will influence the amount bid for a camera).

We conducted separate follow-up studies investigating the impact of priming when the value of a product was indicated by the marketplace (i.e., MSRP) because we found meaningful differences in effect sizes between relevant and irrelevant products in Study 1. Study 2 found that even in the presence of an MSRP, the price of a relevant product in an advertisement (i.e., laptop when the participants were shopping for a laptop) influenced the amount bid – a higher priced product induced participants to bid higher and a lower priced product induced a lower bid. Study 3 found no effects on the bid amount when an irrelevant product was advertised. Taken together, Studies 2 and 3 show that when the value of a product is indicated by a MSRP, the value implied by the MSRP dominated the advertised price of an irrelevant product, but not a relevant product.

We argued that both deliberate rational cognition and non-conscious automatic cognition would influence the amount bid. The advertised price for a relevant product could be used by deliberate rational cognition when trying to assess the value of a product (e.g., the price of a laptop from one manufacturer when trying to assess the value of a laptop from another manufacturer). When the product advertised is irrelevant, deliberate rational cognition will ostensibly ignore it. However, non-conscious cognition automatically processes all stimuli including irrelevant advertising, and presents its conclusions to the rational process, which is then influenced to bid higher or lower.

Study 1 shows that when the value of a product is unclear, non-conscious cognition has a significant impact on the amount bid. It will process any stimuli (such as the price of an irrelevant product) and suggest it to deliberate rational cognition. Studies 2 and 3 show that then the value of a product is clearer (as suggested by MSRP), the effect of non-conscious cognition is reduced. Either rational cognition dominates because it has a clear indication of value to work from (MSRP) or non-conscious cognition has more than one stimuli to process (the irrelevant price and the MSRP) so the impact of the irrelevant price is weakened. In either case, the end result is the same.

We cannot directly compare the results from Study 1 to Studies 2 and 3 in the same statistical analysis because the dependent variables are different – amount bid versus amount bid divided by MSRP. However, the use of z-scores enable us to draw a few conclusions by using the confidence intervals around the mean z-score. The effects of a high priced relevant advertisement with no MSRP (95% CI: .263 to .878) is no different than one with an MSRP (95% CI: -1.158 to .490). The same is true for a low priced advertisement: no MSRP (95% CI: -.859 to -.264); MSRP (95% CI: -.519 to .187). The effects of a high priced irrelevant advertisement with no MSRP (95% CI: -2.74 to .350) is no different than one with an MSRP (95% CI: -.125 to .156). The same is also true for a low priced advertisement: no MSRP (95% CI: -.380 to .224); MSRP (95% CI: -.156 to .126).

Prior research has treated priming as a process that occurs before the task of interest. We developed a new form of priming in which the priming stimuli were delivered alongside the focal task, which we called concurrent priming. These studies show that concurrent priming can be effective, even though it competes for attention with the focal task and individuals often claim to ignore advertising, which was the vehicle through which we delivered the priming.

6.1 Implications for research

We believe this study opens a new door in electronic commerce research. Prior studies have examined “rational” factors affecting individuals’ willingness to pay under the assumption of rational choice theory that individuals make rational decisions to optimize personal profit by maximizing gain and/or minimizing cost. These factors are important. However, we need to look beyond the straightjacket of rational choice.

Our research shows that non-conscious automatic cognition influences the amount bid in an online auction. We believe this calls for more research on the effects on non-conscious automatic cognition in online auctions and ecommerce in general.

One important aspect that differentiates this study of concurrent priming from previous research is that we are not priming the subject before they complete the task; we are priming as they work on the task. In other words, much of the past research has been focused on the idea that priming should occur before the task, rather than priming during the task. To our knowledge, this is the first study that examines the impact of concurrent priming in an online auction environment.

Our research shows that using both relevant and irrelevant products impacted the amount bid when the value of a product was unclear (e.g., used products, collectibles), with relevant products having a stronger impact. Future research could look into whether different types of irrelevant advertisements would have different impacts or if the quality of the irrelevant advertisement would change the impact. The same could be said for the relevant advertisement. How much will the actual design of the advertisement impact the priming?

Our research also shows that the effect of priming may be limited. In the presence of an indication of
value (i.e., MSRP) only relevant advertisements had an impact. This indicates that more research should be conducted in this area so that researchers can better understand the limit of concurrent priming. Future research could study different price levels of advertisements, in the presence of a list price, to see if there is a threshold for priming.

In this study, we used lab experiment as research method and undergraduate students as participants. Just like any other methodology, lab experiments using college students as subjects, have strengths and limitations. Those limitations include demand characteristics, social desirability, and lack of motivation for subjects to perform well. Through this study, we want to start the conversation on the priming effect of advertisement on individuals’ willingness to pay in a controlled lab setting. Further research should test our findings in real business settings, such as eBay and Amazon.com.

The results of this study also lead to questions about other online environments. Our research focused only on the online auction environment, where subjects gave their highest willingness to pay. What about in the online shopping environment, in sites like Amazon? Will priming have an effect on product selection? Future research could look into the question by giving subjects a similar task as used in this study. For instance, given five cameras, of varying prices and configurations, to choose from, would a high priced advertisement cause the subject to choose the higher priced camera?

6.2 Implications for practice

The results of this study provide insight into the consumer bidding behavior and thus have practical implications as well. The price of a product in an advertisement displayed while a consumer is bidding affects how much they bid, although advertisements for irrelevant products only influence bids for products whose value is unclear (e.g., used items, collectibles).

Marketers and auction companies can use these results to make subtle design changes in their online auctions, impacting the bidding decisions of consumers. To some degree, some companies are already making note of this. They recognize that they can influence the buying behavior of their consumers and thus advertise related products to help increase sales. For instance, companies may advertise a camera case for cameras, in hopes that when shopping for a camera, the consumer will also decide to buy the case.

Our studies show that such advertising may influence a consumer’s bid price. Such a complementary product would be one we would term irrelevant, because it does not help the consumer establish a value for the product of interest. Thus the price of the complementary product should influence the amount bid for product with an unclear value. Most complementary products are cheaper than the original product, so such advertising may reduce the amount bid.

This research could also have practical implications for consumers. More and more, consumers are becoming aware of the impact of advertising on their decision making, whether it is conscious or non-conscious. Research such as ours can be used to un-bias the minds of consumers. Perhaps in due time, consumers will train themselves to negatively react, bidding much lower if they see a high priced advertisement.

7. Conclusion

Decision making has been a large part of IS research and though it has historically been focused on the rational cognition, there is a need to better understand the impact of non-conscious cognition. Our research has a provided a first step by examining the concurrent priming effects of relevant and irrelevant advertising.

8. Reference


[38] O. Turel, A. Serenko, and P. Giles, "Integrating technology addiction and use: An empirical investigation of


Table 1. Study 1 Data analysis results

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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.038</td>
<td>1.016</td>
<td>-0.078</td>
</tr>
</tbody>
</table>

Note: The dependent variable is the z-score of the amount bid.

Table 2. Study 2 Data analysis results

<table>
<thead>
<tr>
<th></th>
<th>High Price Advertisement</th>
<th>Low Price Advertisement</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bid Amount</td>
<td>Std. Dev.</td>
<td>Bid Amount</td>
</tr>
<tr>
<td>Relevant Ad</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.166</td>
<td>0.943</td>
<td>-0.166</td>
</tr>
</tbody>
</table>

Note: The dependent variable is the z-score of the amount bid as a percent of MSRP.

Table 3. Study 3 Data analysis results

<table>
<thead>
<tr>
<th></th>
<th>High Price Advertisement</th>
<th>Low Price Advertisement</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bid Amount</td>
<td>Std. Dev.</td>
<td>Bid Amount</td>
</tr>
<tr>
<td>Irrelevant Ad</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.015</td>
<td>1.001</td>
<td>0.015</td>
</tr>
</tbody>
</table>

Note: The dependent variable is the z-score of the amount bid as a percent of MSRP.

Figure 1. Example of experiment screen