Dec 11th, 12:00 AM

Unlocking the Psychology of Online Travel Booking: How Price Expectations Affect Consumers

YUTING GAO
National University of Singapore, gao.yuting@u.nus.edu

Zhenhui Jiang
the University of Hong Kong, jiangz@hku.hk

Hailiang Chen
The University of Hong Kong, chen19@hku.hk

Khim Yong Goh
National University of Singapore, gohky@comp.nus.edu.sg

Unlocking the Psychology of Online Travel Booking: How Price Expectations Affect Consumers

Short Paper

Yuting Gao
ESCP Business School
Madrid, Spain
ygao@escp.eu

Zhenhui (Jack) Jiang
The University of Hong Kong
Hong Kong
jiangz@hku.hk

Khim Yong Goh
National University of Singapore
Singapore
gohky@comp.nus.edu.sg

Hailiang Chen
The University of Hong Kong
Hong Kong
chen19@hku.hk

Abstract

Price fluctuation is a major concern for consumers in making travel plans, such as booking flights or hotels. Thus, consumers tend to hesitate over whether to make a booking or not. Online travel booking platforms such as Kayak, Hopper, and Google Flights, have been adopting various digital nudges to influence consumers' price expectations. For example, they may inform users that "Prices are unlikely to decrease within 7 days" (reassurance) or "Prices may rise within 7 days" (alert). Despite the pervasive adoption of reassurance and alert nudges in online travel booking, little is known about how they influence consumers' price expectations and travel booking behavior, and why. We plan to conduct a lab experiment and a randomized field experiment in collaboration with a leading travel metasearch platform to investigate how digital nudges like reassurance and alert may affect individuals' emotions, price expectations, and subsequent online travel booking behavior.

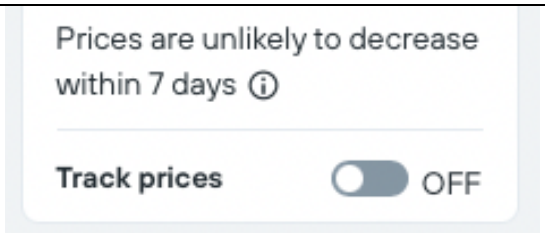
Keywords: Price expectations, online travel booking, confidence, anticipated regret

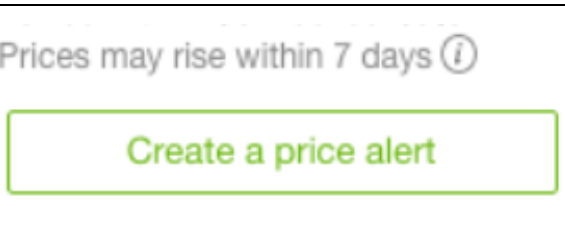
Introduction

Flight ticket and hotel prices frequently vary with seasonality, availability, and price movements of competitors (Etzioni et al. 2003). Therefore, consumers often face the dilemma of accepting a "current" price or waiting for a future "uncertain and volatile" price (Chellappa et al. 2011; Clemons et al. 2002). Such price uncertainty can cause consumers to hesitate in their immediate purchase decisions (Matzler et al. 2008). Certainly, consumers can benefit if they decide not to buy immediately, and the price subsequently drops as expected (DelVecchio et al. 2007). However, if consumers make a wrong judgment about the future price trend, for example, when they expect the price to drop but it actually increases later, consumers will suffer loss and regret "forgoing a good deal" (Kukar-Kinney and Close 2010).

In practice, online travel booking platforms such as Kayak, Hopper, and Google Flights, have been adopting various digital nudges (Weinmann et al. 2016) to influence consumers' price expectations and behavior. For example, they may inform users that "Prices are unlikely to decrease within 7 days" (reassurance) or "Prices may rise within 7 days" (alert) (see Figure 1 for screenshots). While both types of nudges provide

more information to consumers and possibly attempt to change consumers' price perceptions, they share subtle differences in messaging. Reassurance aims to comfort consumers, ease the distress of future price fluctuation and boost consumers' confidence in the current price (Chang and Tseng 2014), while alert may expose consumers to feelings of fear, anxiety, and regret about potential price surges (Zeelenberg and Pieters 2004). Despite the pervasive adoption of reassurance and alert nudges in online travel booking, little is known about their impacts. Do both reassurance and alert nudges promote purchases, or do they have differential impacts? What are the underlying mechanisms for such nudges to play a role? Therefore, this study aims to fill the research gap and answer the research question: *how do reassurance and alert nudges affect users' price expectations and online travel booking behavior, and why?*





Reassurance	Alert

Figure 1. Screenshots of Two Digital Nudges Adopted by Online Travel Websites

To investigate how digital nudges like reassurance and alert may affect individuals' emotions, price expectations, and subsequent online travel booking behavior, we plan to conduct a laboratory experiment and a field experiment. Although "digital nudging" has been receiving more and more attention from researchers in the information systems and e-commerce fields, previous work has majorly focused on the impact of digital nudging on individuals' perceptions of product quality, and there is a lack of understanding on the connection between digital nudging and perception of price. Our work fills this research gap on digital nudging for price expectations in e-commerce.

The study can also directly contribute to the literature on online travel. The online travel industry is the largest e-commerce category and comprised 36% of all business-to-consumer e-commerce sales in 2012 (Li et al. 2017). Most of the existing research on air travel explores the industry as a whole (Serio et al. 2018), while very few pay attention to users of online travel platforms and how their purchase decisions are influenced by external and internal factors (Li et al. 2014). We complement the research on online travel by empirically testing how digital nudging affects consumers' decision-making process.

The rest of the paper is organized as follows. In the next section, we will review previous studies about digital nudging and price expectations in psychology, marketing, and information systems. Next, we develop hypotheses about how the "reassurance" and "alert" nudges may influence consumers' price expectations and shopping decisions. Next, we describe our laboratory experiment and field experiment designs. In the last section, we conclude by discussing future research plans and potential contributions to research and practice.

Literature Review

Nudge and Digital Nudging

A "nudge" is a choice architecture that positively takes advantage of heuristics and psychological biases of human judgment to help people make smarter decisions and get better off (Thaler and Sunstein 2009). The nudge is distinct from traditional motivating strategies in that it does not change the economic incentives for consumers significantly. Promotions, sales, or discounts, attract consumers by providing financial incentives: a lower price. On the contrary, a "nudge" alters people's behavior in a subliminal way using judgment heuristics and biases. In addition, a nudge is not mandatory. People still have the freedom to choose whatever they like, whatever they want, or whatever is good from their perspectives. The nudge attracts people's attention in a particular direction, so people are likely to choose one or some options

wisely. The nudging strategy is particularly impactful when people lack information in evaluating the situation and find it difficult to make decisions (Thaler and Sunstein 2009).

Grounding on the nudge theory, digital nudging refers to the use of design elements to guide people's judgment and behavior in digital choice environments: user interfaces such as websites and mobile apps (Weinmann et al. 2016). Unlike traditional nudging, which has been widely adopted to influence people's behavior in various offline scenarios, digital nudging focuses on the online environment (Huang et al. 2018; Mirsch et al. 2017). With the development of the Internet and consumers' increasing usage of online services and reliance on online platforms, researchers pay more and more attention to digital nudging. For example, Acquisti (2009) find that digital nudging can influence online users' privacy preferences and thus change their online privacy revelation behavior. Huang et al. (2018) show that digital nudging can effectively encourage online social sharing behavior. Digital nudging also works in social media to reduce the addictive features of social media and help users combat social media addiction (Purohit et al. 2020). In healthcare, digital nudging, such as numbers displayed on health apps, also influences people's exercise performance (Shen and Hsee 2017). Regarding e-commerce, studies have explored digital nudging techniques like limited-time promotions, limited product availability, and their impacts on perceived product value and consumers' purchase decisions (Amirpur and Benlian 2015; Djurica and Figl 2017). Recently, researchers have found that digital nudging can foster e-commerce's social and environmental targets by encouraging users' online grocery purchase behaviors in line with social and ecological objectives (Auf der Landwehr et al. 2021), increasing users' tendency for carbon offsetting in e-commerce checkout processes (Franzoi and vom Brocke 2022), and promoting consumers' daily energy conservation behavior (Berger et al. 2022).

Price Perception and Price Expectation

Existing research suggests that consumers' price perception plays a vital role in their shopping decisions (Urbany et al. 1989). The attractiveness of a price is not only determined by the focal price itself but also by some "reference price" (Kalyanaram and Little 1994). There are various conceptual and operational definitions of the reference price. The reference price can be a competitor's price or the market average price (Monroe 1973). The reference can also be a past price, for example, a price recently paid by the consumer (Greenleaf and Lehmann 1995; Kalwani and Yim 1992; Kalwani et al. 1990), or a range of price the consumer remembers by doing a search (Janiszewski and Lichtenstein 1999). Retailers can affect individuals' purchase behavior by adjusting the reference price to influence price perception. For example, some stores advertise a high price so that when consumers visit the store and find out there is a sale, they would have the impression that the price is low and are thus more likely to make a purchase (Urbany et al. 1988). Discount stores like Marshalls and T.J. Maxx have been using this strategy by making claims like "Compare at $X, our price $Y" (Kopalle and Lindsey-Mullikin 2003).

This study focuses on the future price as a reference price. Sometimes there is a specific future price. Sometimes, however, consumers do not have accurate information about the future price, so they form expectations of the future price based on available cues like future promotion probability. Researchers find that consumers' perception of future prices plays an essential role in consumers' decisions about whether to buy and when to buy the product (Jacobson and Obermiller 1990). For example, people may expect the price to be lower in the future due to an upcoming promotion (Kalwani and Yim 1992), a discount (DelVecchio et al. 2007), or a coupon (Gönül and Srinivasan 1996). In that case, they may delay the decision-making process (Greenleaf and Lehmann 1995). The reason is that people usually want to pay the price as low as possible for the same product. According to the classic economic surplus model, consumer welfare is the difference between consumer budget constrain and the actual price they pay (Boulding 1945). Therefore, the lower the price the consumer pays, the higher the welfare she experiences.

How a future price acts as the reference price and affects individuals' behavior is particularly relevant for the online travel industry, considering that there are common price fluctuations, and more importantly, intertemporal changes in airfares and hotel prices are challenging to predict (Li et al. 2014). For example, researchers find that consumers are more likely to anticipate that prices might decrease and thus delay their purchases (bookings) for shorter trips with more attractive outside options (Li et al. 2014).

Hypothesis Development

In the context of online flight and hotel booking and the accompanied frequent price fluctuations, consumers face high price uncertainty, so they are cautious and are reluctant to purchase because they worry if they buy now and find out future prices decrease in the future. People have difficulties deciding whether they should take an offer or wait for a better deal. Thus, consumers need to, and are willing to process information useful and diagnostic for their price evaluation. If the information is offered by the company, or the professional platform, it is also likely to be perceived to be "credible and persuasive" (Chaiken and Maheswaran 1994). Therefore, some manipulations of price expectations can act as a nudge and affect people's judgment and purchase decisions (Thaler and Sunstein 2009). We find two nudges frequently adopted by online travel platforms.

The reassurance nudge aims to reduce consumers' concerns about potential price fluctuation and increase their confidence in the product. Reassurance is something that is said or done to make someone feel calmer and less worried or frightened about a problem or solution. Reassurance has been widely adopted in marketing as a strategy to relieve consumers' concerns (Rogers and Thistlethwaite 1970). For example, researchers find that consumers may experience post-purchase dissonance, a feeling of uncertainty about whether their purchases are worthy or not (Keng and Liao 2013). Because of the doubt, some buyers may ask for a return or refund. To alleviate such dissonance, some firms take reassurance actions like sending an email to customers reaffirming the excellent product features and outstanding quality. Therefore, consumers can see the "rightness" of their decision, feel more confident about the products, and are thus less likely to return a product or request a refund (Milliman and Decker 1990; Nadeem 2007).

Online travel booking platforms can reassure consumers that "price is unlikely to decrease". Such reassurance can reduce people's concerns about potential price fluctuation, and lead to an expectation of stable future price, neither plunging or surging significantly. Under such circumstances, consumers would feel less risky about an immediate purchase because they do not have to worry about seeing a better deal in the future. Thus, consumers would feel confident in the current price and believe that the current price is "the lowest available". Therefore, consumers are more likely to make a purchase right away instead of waiting for "a better deal".

Therefore, we propose:

Hypothesis 1a: The reassurance nudge would increase consumers' confidence in the price.

Hypothesis 1b: The reassurance nudge would cause consumers to expect the future price to be stable.

Hypothesis 1c: The reassurance nudge would positively affect consumers' purchase behavior.

The alert nudge aims to remind consumers about potential price surges and induce their feelings of fear, anxiety, and regret. Companies can alert consumers that if they hesitate, the future price will rise. In other words, consumers face two options, buy now at a lower price, or (not buy now and) buy later at a probably higher price. Regret theory suggests that, when facing multiple options, instead of taking the option that yields the largest expected utility (Savage 1951), people tend to take the option that would minimize the anticipated regret (Baron 1991; Bell 1982; Loomes and Sugden 1982; Sage and White 1983). Anticipated regret refers to the sense of sorrow or disappointment over something not done (Landman 1987), which may result from comparing the actual outcome with the alternatives rejected (Simonson 1992). Researchers find that people often anticipate how much regret they will feel before making decisions (Mellers et al. 1999; Mellers et al. 1997). For example, in one lab experiment where subjects were asked to predict their feelings about the potential outcomes compared to the unobtained outcome (counterfactual/alternative choice), they expected to feel worse (more disappointed/ regretful) when the obtained outcome turned out to be worse than the counterfactual (Mellers et al. 1999). Subjects would thus avoid the option that could make them feel more regretful and take the option that minimizes anticipated negative affect in the decision-making stage. In other words, when making decisions, people would compare alternatives and make the choice that will minimize anticipated regret (Zeelenberg and Pieters 2004).

The alert nudge can cause consumers to fear that if they do not make a purchase now, they have to accept a higher price in the future, suffer a loss, and thus they would regret losing a good deal in an earlier period (which is now). In other words, consumers will anticipate how much they may regret if they miss the current

deal and see a worse deal in the future. Thus, following the heuristic of "anticipated regret minimization", expecting an upward price change, consumers are more likely to buy now than to wait.

Therefore, we propose:

Hypothesis 2a: The alert nudge would increase consumers' anticipated regret.

Hypothesis 2b: The alert nudge would cause consumers to expect the future price to rise.

Hypothesis 2c: The alert nudge would positively affect consumers' purchase behavior.

Research Methodology

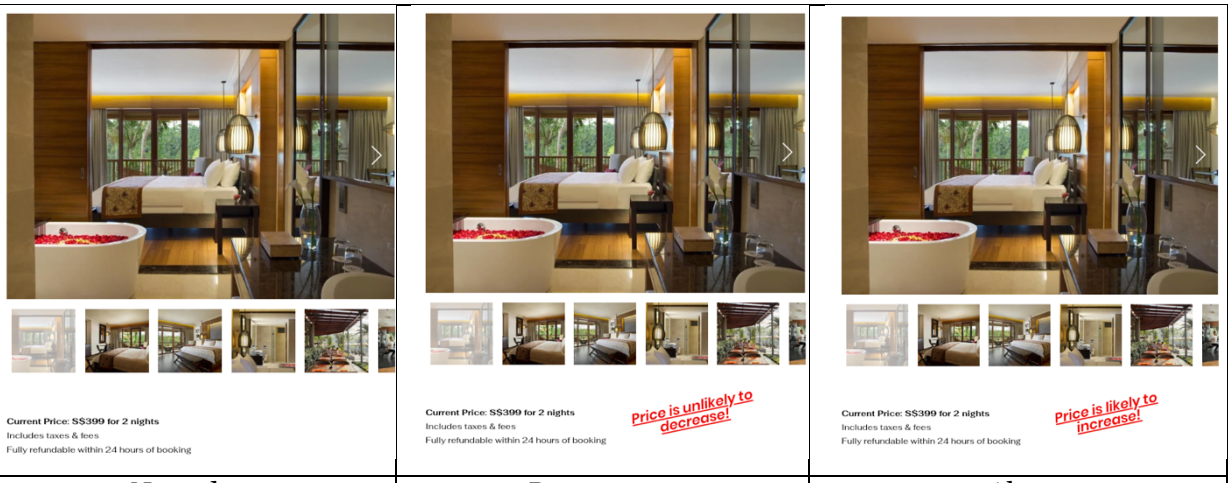
Study 1: Laboratory Experiment

We plan to conduct a laboratory experiment to test the hypotheses. The lab experiment will adopt a between-subjects design, where participants are randomly assigned to one of the three conditions: no nudge, reassurance, or alert. In the experiment, participants will be asked to imagine that they are planning to attend their best friend's wedding in Bali, Indonesia, in one month, and want to decide whether to book a 2-night stay at the wedding hotel, which is strongly recommended by their best friend, and where all other wedding guests would stay. The experiment scenario is set specifically as wedding hotel booking, rather than alternatives like staycations, family trips, or graduation trips. The wedding hotel is pre-determined by the wedding hosts. As such, participants will focus on the hotel itself. This enables us to examine how different nudges may influence participants' price expectations and hotel booking decisions and to rule out potential confounding effects of alternative hotels. To make sure that participants get fully involved in the imagined scenario, an experimental web page will be created, which contains a brief introduction to the wedding hotel, some pictures of the hotel, and an official video of the hotel. It is mandatory to watch the video before proceeding to the page of the hotel room details, where the nudge is implemented, as shown in Figure 2.

After browsing the hotel room details, participants will be asked to indicate their booking intention by choosing one of the two options: "I wish to book now", or "I wish to book later". Next, they will be redirected to a linked survey. First, participants are asked to indicate their expectations of the hotel price by rating to what extent they agreed with the three statements: (1) It is likely that the price of the hotel will increase in the near future, (2) It is likely that the price of the hotel will stay stable in the near future, and (3) It is likely that the price of the hotel will decrease in the near future (on a 7-point Likert scale). In addition, participants will answer the question "What do you expect the price to be like in the near future?" by choosing one of the three options: "To rise", "To stay stable", or "To drop".

Second, participants will indicate their intention to book the hotel by rating to what extent they agreed with the two statements: (1) Booking the hotel now is the best option for me, and (2) I prefer to wait for some time before booking the hotel (on a 7-point Likert scale; adapted from Jiang and Benbasat (2007) and Zeelenberg and Pieters (2004)). Third, participants will be asked about how confident they felt about the hotel deal by rating to what extent they agreed with the three statements:(1) The current hotel price is a good bargain, (2) I feel at ease with the hotel price, and (3) I'm positive that this hotel's current price is a good deal (on a 7-point Likert scale; adapted from Hunt (1970)). Next, participants will rate their feelings of anticipated regret: (1) If I do not book the hotel now, I may regret in the future, (2) If I miss the chance to book the hotel now, I will feel disappointed later, and (3) If I do not book the hotel now, I will feel upset with myself in the future (on a 7-point Likert scale; adapted from Zeelenberg and Pieters (2004), Sheeran and Orbell (1999), and Pierro et al. (2008)).

To ensure that the treatment message is effectively implemented, participants will be asked to indicate whether they see any message on the hotel room details page: no message, "Price is unlikely to decrease", or "Price is likely to increase". Upon completing the short survey, the participants will be thanked and reimbursed with cash equivalent to around US$6 for their participation. A total of about 120 full-time students (average age of about 22 years old) from a public university in Asia are expected to participate in the experiment, with each condition that include about 40 participants.

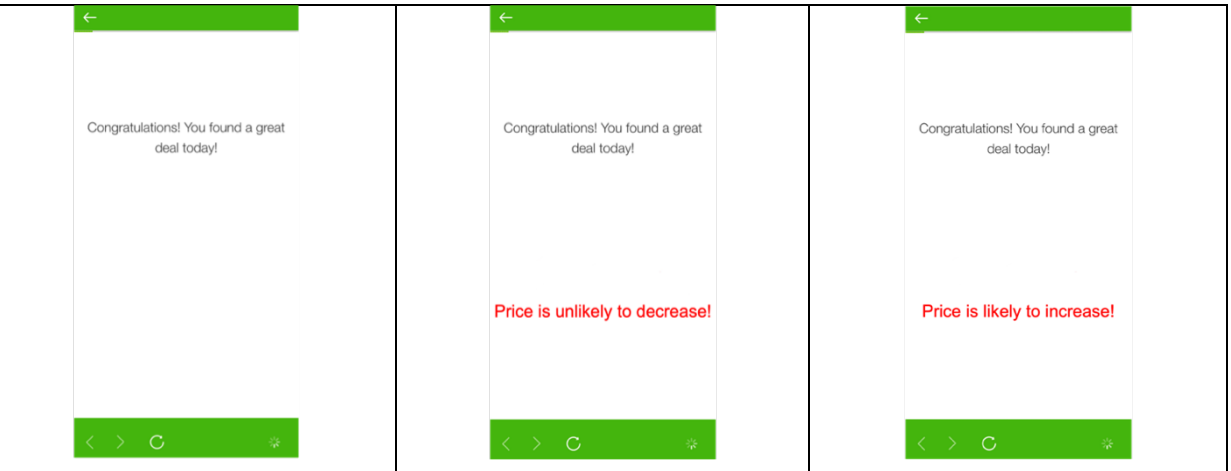


No nudge	Reassurance	Alert

Figure 2. Screenshots of the Experiment Web Page

Study 2: Field Experiment

The laboratory experiment can help us understand how reassurance and alert nudges may influence consumers' price expectations and booking intentions. However, decision-making in the controlled lab experiment may differ from that in real-world settings (Roe and Just 2009). Therefore, we plan to conduct a randomized field experiment in collaboration with a leading travel metasearch platform, to improve the external validity of our findings. We plan to implement the treatment message on the hand-off page of the platform's iOS app, as shown in Figure 3. The field experiment will adopt a between-subjects design, where users will be randomly assigned to one of the three conditions: no nudge, reassurance, or alert. To rule out the effect of alternative hotel options, we are planning to manipulate the presentation of alternatives across conditions. For instance, if possible, we will ensure that the focal hotel option and alternative hotel options presented to all participants searching for hotels in a specific location (e.g., Bali, Indonesia) are identical (same set of alternative hotels, prices, and descriptions) and that the only difference is the presence or absence of the nudge for a focal hotel. We plan to collect iOS app clickstream data 4 weeks before and 4 weeks after the treatment. The dataset includes all click details, such as the click date, hotel stay date, hotel location, hotel deal price, booking status, and whether there was a specific nudge on the hand-off page.



No nudge	Reassurance	Alert

Figure 2. Screenshots of the Experiment Web Page

Discussion

To explore the effect of reassurance and alert on consumers' price expectations and travel booking behavior, we first plan to conduct a laboratory experiment. We hypothesize that the alert nudge can lead to an expectation of rising future prices, induce feelings of anticipated regret, and thus increase consumers' intention to book the hotel; the reassurance nudge can lead to an expectation of stable future prices, increase consumers' confidence in the current price, and thus increase consumers' intention to book the hotel. Next, we plan to conduct a field experiment in collaboration with an online travel booking platform, and implement the nudges in their iOS app. Although we can show how reassurance and alert nudges may affect participants in the lab, it is also important to validate the findings in the field, as people's behavioral intentions may differ from their behaviors in the real-world. We expect that in the field experiment, the alert and reassurance nudges can increase consumers' online travel booking behavior. The findings from the field experiment can improve the external validity of our study. In addition, users more and more rely on their mobile devices to plan their trips and book hotels and flights. According to the report by Expedia, U.S. users consistently spend 25% more time engaging with travel content on mobile devices than on desktop since October 2015, and mobile applications and browsers now reach 75% of all U.S. online travel users, while desktop reaches only 55%. By implementing the digital nudging messages on the mobile app, we can understand how mobile app users' decisions are influenced.

Being one of the first studies to investigate the impacts of reassurance and alert on consumers' price expectations and online travel booking behaviors, our work complements the literature on digital nudging by enhancing our understanding of the effect of digital nudging on people's price expectations. Our work also contributes to the theory of reassurance. Previous studies found that reassurance can increase consumers' confidence in products and improve their satisfaction with products and attitudes toward sellers, when consumers are reassured post-purchase (Milliman and Decker 1990; Nadeem 2007). Our study contributes by studying the impact of pre-purchase reassurance on consumers' price expectations and following purchase behaviors in the context of online travel booking, where consumers face high price uncertainty. It is expected that reassurance can potentially reduce consumers' concerns about price fluctuation, increase consumers' confidence in price, and thus increase their likelihood of purchasing. These findings can inform the design of online travel booking platforms. Online travel platforms try to use reassurance and alert nudges to influence consumers' price expectations and travel booking behavior. Understanding the mechanisms of the reassurance and alert nudges can help platforms better design more effective marketing strategies to influence consumer behavior. For example, if a consumer is exposed to the reassurance nudge, the platform can predict her price expectation that she is likely to expect the price to be stable in the future. Under such circumstances, if the platform recommends a similar product with a slightly lower price, the consumers might find the price to be particularly attractive, and make a purchase immediately.

Acknowledgements

This study was funded by the Research Grants Council of Hong Kong (HKU 17502921), the University Research Committee of the University of Hong Kong (201905159007), Theme-based Research Fund from HKU Education Consulting (Shenzhen) Co., LTD. (Grant Number SZRI2023-TBRF-02).

References

Acquisti, A. 2009. "Nudging Privacy: The Behavioral Economics of Personal Information," *IEEE Security & Privacy* (7:6), pp. 82-85.

Amirpur, M., and Benlian, A. 2015. "Buying under Pressure: Purchase Pressure Cues and Their Effects on Online Buying Decisions," *36th International Conference on Information Systems, Fort Worth*.

Auf der Landwehr, M., Trott, M., and von Viebahn, C. 2021. "Consumers Choice? Fostering Sustainability in Grocery Deliveries through Digital Nudging," *29th European Conference on Information Systems*.

Baron, J. 1991. "The Role of Anticipated Emotions in Decision Making," *A Conference on the Role of Anticipation and Regret in Decision Making, La Jolla, CA*.

Bell, D. E. 1982. "Regret in Decision Making under Uncertainty," *Operations Research* (30:5), pp. 961-981.

Berger, M., Greinacher, E., and Wolf, L. 2022. "Digital Nudging to Promote Energy Conservation Behavior-Framing and Default Rules in a Smart Home App," *ECIS 2022*.

Boulding, K. E. 1945. "The Concept of Economic Surplus," *The American Economic Review* (35:5), pp. 851-869.

Chaiken, S., and Maheswaran, D. 1994. "Heuristic Processing Can Bias Systematic Processing: Effects of Source Credibility, Argument Ambiguity, and Task Importance on Attitude Judgment," *Journal of Personality and Social Psychology* (66:3), p. 460.

Chang, C.-C., and Tseng, A.-H. 2014. "The Post-Purchase Communication Strategies for Supporting Online Impulse Buying," *Computers in Human Behavior* (39), pp. 393-403.

Chellappa, R. K., Sin, R. G., and Siddarth, S. 2011. "Price Formats as a Source of Price Dispersion: A Study of Online and Offline Prices in the Domestic Us Airline Markets," *Information Systems Research* (22:1), pp. 83-98.

Clemons, E. K., Hann, I.-H., and Hitt, L. M. 2002. "Price Dispersion and Differentiation in Online Travel: An Empirical Investigation," *Management Science* (48:4), pp. 534-549.

DelVecchio, D., Krishnan, H. S., and Smith, D. C. 2007. "Cents or Percent? The Effects of Promotion Framing on Price Expectations and Choice," *Journal of Marketing* (71:3), pp. 158-170.

Djurica, D., and Figl, K. 2017. "The Effect of Digital Nudging Techniques on Customers' Product Choice and Attitudes Towards E-Commerce Sites," *23rd Americas Conference on Information Systems, Boston*, p. 5.

Etzioni, O., Tuchinda, R., Knoblock, C. A., and Yates, A. 2003. "To Buy or Not to Buy: Mining Airfare Data to Minimize Ticket Purchase Price," *Proceedings of the Ninth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*: ACM, pp. 119-128.

Franzoi, S., and vom Brocke, J. 2022. "Sustainability by Default? Nudging Carbon Offsetting Behavior in E-Commerce," *30th European Conference on Information Systems*.

Gönül, F., and Srinivasan, K. 1996. "Estimating the Impact of Consumer Expectations of Coupons on Purchase Behavior: A Dynamic Structural Model," *Marketing Science* (15:3), pp. 262-279.

Greenleaf, E. A., and Lehmann, D. R. 1995. "Reasons for Substantial Delay in Consumer Decision Making," *Journal of Consumer Research* (22:2), pp. 186-199.

Huang, N., Chen, P. Y., Hong, Y. L., and Wu, S. Y. 2018. "Digital Nudging for Online Social Sharing: Evidence from a Randomized Field Experiment," *51st Hawaii International Conference on System Sciences* pp. 1483-1491.

Hunt, S. D. 1970. "Post-Transaction Communications and Dissonance Reduction," *Journal of Marketing* (34:3), pp. 46-51.

Jacobson, R., and Obermiller, C. 1990. "The Formation of Expected Future Price: A Reference Price for Forward-Looking Consumers," *Journal of Consumer Research* (16:4), pp. 420-432.

Janiszewski, C., and Lichtenstein, D. R. 1999. "A Range Theory Account of Price Perception," *Journal of Consumer Research* (25:4), pp. 353-368.

Jiang, Z., and Benbasat, I. 2007. "The Effects of Presentation Formats and Task Complexity on Online Consumers' Product Understanding," *MIS Quarterly* (31:3), pp. 475-500.

Kalwani, M. U., and Yim, C. K. 1992. "Consumer Price and Promotion Expectations: An Experimental Study," *Journal of Marketing Research* (29:1), pp. 90-100.

Kalwani, M. U., Yim, C. K., Rinne, H. J., and Sugita, Y. 1990. "A Price Expectations Model of Customer Brand Choice," *Journal of Marketing Research* (27:3), pp. 251-262.

Kalyanaram, G., and Little, J. D. 1994. "An Empirical Analysis of Latitude of Price Acceptance in Consumer Package Goods," *Journal of Consumer Research* (21:3), pp. 408-418.

Keng, C. J., and Liao, T. H. 2013. "Self-Confidence, Anxiety, and Post-Purchase Dissonance: A Panel Study," *Journal of Applied Social Psychology* (43:8), pp. 1636-1647.

Kopalle, P. K., and Lindsey-Mullikin, J. 2003. "The Impact of External Reference Price on Consumer Price Expectations," *Journal of Retailing* (79:4), pp. 225-236.

Kukar-Kinney, M., and Close, A. G. 2010. "The Determinants of Consumers' Online Shopping Cart Abandonment," *Journal of the Academy of Marketing Science* (38:2), pp. 240-250.

Landman, J. 1987. "Regret and Elation Following Action and Inaction: Affective Responses to Positive Versus Negative Outcomes," *Personality and Social Psychology Bulletin* (13:4), pp. 524-536.

Li, J., Granados, N., and Netessine, S. 2014. "Are Consumers Strategic? Structural Estimation from the Air-Travel Industry," *Management Science* (60:9), pp. 2114-2137.

Li, Y., Xie, Y., and Zheng, E. 2017. "Modeling Multi-Channel Advertising Attribution across Competitors," in: *SSRN 3047981*.

Loomes, G., and Sugden, R. 1982. "Regret Theory: An Alternative Theory of Rational Choice under Uncertainty," *The Economic Journal* (92:368), pp. 805-824.

Matzler, K., Grabner-Kräuter, S., and Bidmon, S. 2008. "Risk Aversion and Brand Loyalty: The Mediating Role of Brand Trust and Brand Affect," *Journal of Product & Brand Management* (17:3), pp. 154-162.

Mellers, B., Schwartz, A., and Ritov, I. 1999. "Emotion-Based Choice," *Journal of Experimental Psychology: General* (128:3), p. 332.

Mellers, B. A., Schwartz, A., Ho, K., and Ritov, I. 1997. "Decision Affect Theory: Emotional Reactions to the Outcomes of Risky Options," *Psychological Science* (8:6), pp. 423-429.

Milliman, R. E., and Decker, P. J. 1990. "The Use of Post-Purchase Communication to Reduce Dissonance and Improve Direct Marketing Effectiveness," *The Journal of Business Communication (1973)* (27:2), pp. 159-170.

Mirsch, T., Lehrer, C., and Jung, R. 2017. "Digital Nudging: Altering User Behavior in Digital Environments," *Proceedings der 13. Internationalen Tagung Wirtschaftsinformatik (WI 2017)*), pp. 634-648.

Monroe, K. B. 1973. "Buyers' Subjective Perceptions of Price," *Journal of Marketing Research* (10:1), pp. 70-80.

Nadeem, M. M. 2007. "Post-Purchase Dissonance: The Wisdom of The'repeat'purchases," *Journal of Global Business Issues* (1:2), p. 183.

Pierro, A., Leder, S., Mannetti, L., Higgins, E. T., Kruglanski, A. W., and Aiello, A. 2008. "Regulatory Mode Effects on Counterfactual Thinking and Regret," *Journal of Experimental Social Psychology* (44:2), pp. 321-329.

Purohit, A. K., Holzer, A., Barclay, L., and Assoc Comp, M. 2020. "Designing for Digital Detox: Making Social Media Less Addictive with Digital Nudges," *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*, pp. 1-9.

Roe, B. E., and Just, D. R. 2009. "Internal and External Validity in Economics Research: Tradeoffs between Experiments, Field Experiments, Natural Experiments, and Field Data," *American Journal of Agricultural Economics* (91:5), pp. 1266-1271.

Rogers, R. W., and Thistlethwaite, D. L. 1970. "Effects of Fear Arousal and Reassurance on Attitude Change," *Journal of Personality and Social Psychology* (15:3), p. 227.

Sage, A. P., and White, E. B. 1983. "Decision and Information Structures in Regret Models of Judgment and Choice," *IEEE Transactions on Systems, Man, and Cybernetics* (SMC-13:2), pp. 136-145.

Savage, L. J. 1951. "The Theory of Statistical Decision," *Journal of the American Statistical Association* (46:253), pp. 55-67.

Serio, L., Tedeschi, P., and Ursino, G. 2018. "Making Sense of (Ultra) Low-Cost Flights Vertical Differentiation in Two-Sided Markets," *Management Science* (64:1), pp. 401-420.

Sheeran, P., and Orbell, S. 1999. "Augmenting the Theory of Planned Behavior: Roles for Anticipated Regret and Descriptive Norms," *Journal of Applied Social Psychology* (29:10), pp. 2107-2142.

Shen, L. X., and Hsee, C. K. 2017. "Numerical Nudging: Using an Accelerating Score to Enhance Performance," *Psychological Science* (28:8), pp. 1077-1086.

Simonson, I. 1992. "The Influence of Anticipating Regret and Responsibility on Purchase Decisions," *Journal of Consumer Research* (19:1), pp. 105-118.

Thaler, R. H., and Sunstein, C. R. 2009. *Nudge: Improving Decisions About Health, Wealth, and Happiness*. Penguin.

Urbany, J. E., Bearden, W. O., and Weilbaker, D. C. 1988. "The Effect of Plausible and Exaggerated Reference Prices on Consumer Perceptions and Price Search," *Journal of Consumer Research* (15:1), pp. 95-110.

Urbany, J. E., Dickson, P. R., and Wilkie, W. L. 1989. "Buyer Uncertainty and Information Search," *Journal of Consumer Research* (16:2), pp. 208-215.

Weinmann, M., Schneider, C., and vom Brocke, J. 2016. "Digital Nudging," *Business & Information Systems Engineering* (58:6), pp. 433-436.

Zeelenberg, M., and Pieters, R. 2004. "Beyond Valence in Customer Dissatisfaction: A Review and New Findings on Behavioral Responses to Regret and Disappointment in Failed Services," *Journal of Business Research* (57:4), pp. 445-455.