

# The effect of default opt-ins and social proof tags on high-stake decision-making in an e-commerce context

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## SUMMARY

Previous research has investigated how certain strategies can influence people's decisions in simple, everyday choices, such as selecting a loaf of bread or purchasing a book online. The objective of this study was to further the understanding on choice architecture elements of default opt-ins and social proof tags, which are interface elements that signal the use of a product by other individuals. We analyzed their effect in an e-commerce context, specifically exploring high-stake economic decision-making that is characterized by high economic cost (financial or opportunity cost) and high decision importance. We achieved this through investigating the effect of default opt-ins on test ride bookings for an automobile, as well as the influence of social proof tags on click-through rates and 'bookings', which involve a payment of ~5% of the vehicle price made by customers to reserve a place for them on the purchase waitlist. We hypothesized that a default opt-in in the test ride form would have a significant positive influence on the conversion rate. Our findings supported our hypothesis. We further hypothesized that the addition of social proof tags on choices within a set of alternatives would result in a significant increase in the consideration of those choices for purchase. Though the results were inconclusive, our comparative analysis showed the potential importance of both the default options and social proof tags on consumer decision-making, creating an opportunity for further research into the effective use of the combination of defaults and social proof tags in an e-commerce context.

## INTRODUCTION

Businesses have long sought ways to influence consumer economic decision-making. Modern techniques like choice architecture, which include psychological concepts such as default options and social proof, are used to guide decisions through presentation (1). The influence of social proof, a subset of social influence, on economic decision-making is gaining attention. Social influence suggests that our opinions, principles, sentiments, outlook or even conduct may be influenced by the information shared with us by individuals or groups that we perceive to be alike, desirable or specialists within a specific field (2). Social proof is a subset of social influence which involves relying on this shared information as a parameter to judge the validity of our decisions, leading to behavior mimicking friends or peers (3). On the other hand, a technique such as default options can steer consumers

towards certain choices (4). Consumers may also perceive default designations as indicators of product value (5, 6).

Default options lead to the creation of default effects, which are an increase in the probability of selection of a particular option against others for no other reason than it being assigned as the default (4). Existing research on defaults posits three explanations for the default effects.

Firstly, consumers may use defaults as a shortcut to lessen the mental effort needed to choose between the alternatives (7). For example, a study showed that consumers are more likely to remain on an email list when required to opt-out rather than opt-in or when no default option is presented (7). However, this does not fully account for the difference in the effect of expensive or inexpensive defaults on decisions.

The second explanation is that consumers anchor to the default option, which means they are influenced by the option they view first, and this may hinder them from aligning their choices with their actual preferences (8). This anchoring effect could be attributed to loss aversion or the endowment effect, wherein customers are more willing to keep features of the default rather than upgrade an alternative to match the default (8). Hence, this suggests that endowment would have a more significant effect on choices with a higher-end default option than it would with a lower-end default option.

The third explanation is that consumers may interpret default options as representing the will of the marketer and what they would prefer to sell, influencing the consumer's response depending on how they interpret this signal. The phenomenon of consumers using their market understanding and social intelligence to interpret marketing tactics is known as their marketplace metacognition (MM). When consumers have accessible MM, they exercise greater caution in their decision-making processes, keenly aware of the self-serving intentions of marketers (9). Situations where the default options appeared biased were associated with fewer default effects (4).

In contrast, social proof is a less studied concept. However, the rise of social media has made it easier to track the impact of psychological concepts like social proof on decision-making, creating more avenues for research. Specifically, the impact of social proof on online shopping has been explored through the medium of electronic word of mouth (eWOM) communication on Amazon Shorts (2). Research has highlighted eWOM's significant influence on purchase decisions in low-price, homogenous product scenarios like online book sales (2).

Many studies have explored low-cost, low-stakes defaults wherein consumers rely on the default instead of making a deliberate decision (10). However, the impact of social proof on high-stake economic decisions, such as

automobile purchases, has yet to be measured. Such high-stake decisions involve high economic cost (either financial cost or opportunity cost) and decision importance, which is how important a particular decision is to an individual. Previous studies have also shown that consumers believe that more complex, high-stakes decisions like this are more likely to require complex decision-making models such as compensatory rules (11). However, the same study showed that individuals apply simpler models, such as the lexicographic model, rather than more complex models, when making decisions themselves (11). It has been suggested that the research be taken forward and the results examined in an actual high-stake consumption context (11).

We chose to investigate user choices on a two-wheeler automobile manufacturer's website, as purchasing a vehicle is a high-stake decision involving a financial and long-term commitment to the vehicle itself and also influences the social status of buyers (12). Users typically visit a manufacturer's website with a pre-set choice or decision in mind to expand their knowledge and finalize their decision (13). Our study considered specific motorcycle and scooter models that, despite the differing category and target audience, share similar engine specifications and pricing. This scenario allowed us to analyze the influence of loss aversion and endowment on economic decision-making in scenarios where both the opportunity cost and the decision importance are high, leading to more accessible MM and a potential reduction in the effectiveness of nudges such as default opt-ins and social proof.

In this study, we investigated two concepts, default options and social proof and their potential interplay. We conducted an analysis that utilizes changes in the choice architecture of an e-commerce website of a two-wheeler manufacturer, including automatic opt-ins on forms and unique tags on products or options, to investigate the influence of default options and social proof on the economic decision-making of consumers concerning high-intent and high-stake decisions. We hypothesized that the use of default opt-ins to reduce friction, namely time or effort required to make a decision, from decision-making would be associated with an increase in the conversion from enquiries to test rides (TR%). The results supported this hypothesis. Further, we hypothesized that the use of social proof tags to promote specific choice(s), such as that of a particular model or color, would be associated with an increase in consumer uptake of that choice. However, the results lacked statistical significance and the effect of social proof tags as a choice architecture tool on consumer consideration was unclear. Nevertheless, our analysis pointed towards the potential importance of social proof tags and default effects in influencing the high-stake economic decisions of consumers.

## RESULTS

The experiments were conducted on an e-commerce website of a manufacturer of two-wheeled vehicles, namely bikes and scooters. In the first experiment on default opt-ins, the sample set was the total number of enquiries for a specific range of bikes sold by the manufacturer. We measured the proportion of test ride bookings as a fraction of the total enquiries for a specific range of bike models to analyze the influence of default opt-ins on high-stake decisions, such as participating in a test drive. In the second experiment

and third experiment on social proof tags, the sample set was the total number of visits to the catalogue webpage of a range of bikes and the total number of bookings of two models of scooters respectively. We added social proof tags, 'BESTSELLER' and 'Most Popular' to specific bike models and colors respectively. We measured the visits to tagged bike model pages as a proportion of total visits to the catalogue page and the percentage of scooter bookings made with the tagged color to view the influence of social proof on high-stake decisions, such as consideration of a bike model and reserving a scooter of a particular color.

### The Effect of a Default Opt-in on the Test Ride Conversion Rate for Bikes

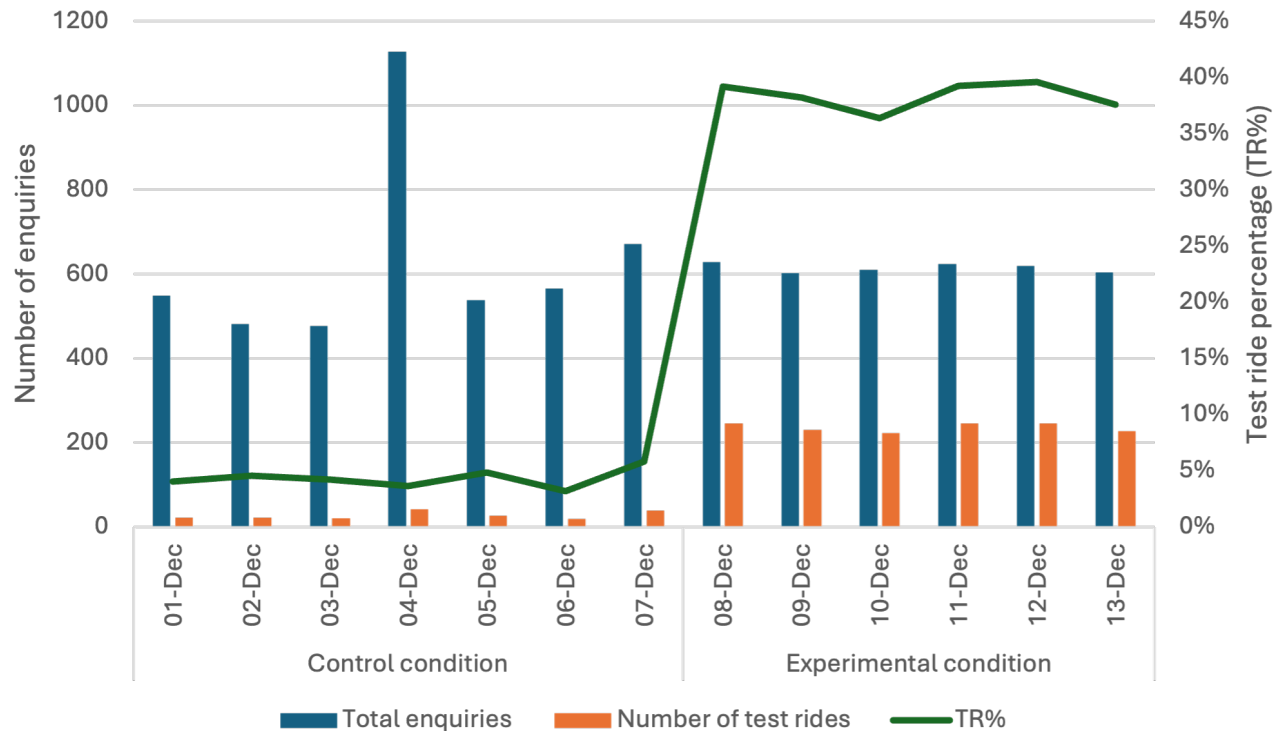
Booking a test ride is typically considered a high-intent decision, one that is thought to be taken by individuals somewhat strongly considering the purchase of that specific vehicle or similar vehicles. It has high stakes due to the high opportunity cost associated with the time and resources spent on travel and at the showroom. The 'Active opt-out' experimental condition allowed us to view the impact on conversions from enquiries to test rides. In this condition, users were presented with a pre-filled test ride form using information from the previously filled enquiry form. The automatic filling of the test-ride forms acts as a nudge that reduces user friction, forcing users to actively opt-out of the default option of submitting the form. Hence, this experiment allowed us to analyze the impact of default effects on a high-stakes decision. We hypothesized that the use of a default opt-in in the test ride form would significantly increase the number of individuals who booked test rides as a proportion of total enquiries (TR%).

The total number of enquiries ( $n = 8,096$ ) on the website was tracked daily from 1 to 13 December 2023. Of these enquiries, the number of conversions to test rides was tracked through a test ride form. The change in the website design was implemented at 00:00 hours on 8 December (**Figure 1**). Hence, data from 1-7 December 2023 ( $n = 4409$ ) was considered the control condition 'Active opt-in' wherein users were not presented with a pre-filled test ride form by default. Data from 8-13 December 2023 ( $n = 3687$ ) was considered the experimental condition 'Active opt-out' wherein via a change in website design, users were presented with a pre-filled test ride form immediately after the enquiry form was submitted.

We conducted a right-tailed, two-proportion z-test to compare the data collected from both datasets. The test showed that the nudge of a default opt-in within the test ride form was associated with a statistically significant increase in the number of test rides booked as a proportion of enquiries when compared to users not presented with the default opt-in (right-tailed two-proportion z-test,  $z = 38.4$ ,  $p < .00001$ ; **Figure 1**). Therefore, the data supports our hypothesis.

### The Effect of Social Proof Tag on Consumers' Consideration of Bike Models

We next analysed the effect of social proof within choice architecture models on high-stake, calculated decision-making of individuals. We added an element of social proof, a tag with the text "BEST SELLER" to the list of models to see whether this element of choice architecture potentially eased the decision for users and caused them to deviate from



**Figure 1: Effect of default opt-ins on the conversion of enquiries to test rides (TR%).** Total enquiries (blue), number of test rides booked (orange), and the number of test rides booked as a percentage of total enquiries (TR%, green line) over the pre-experiment (1 December - 7 December 2023) and post-experiment period (8 December – 13 December 2023). Number of enquiries ( $n = 8,096$ ) and the test rides registered as a proportion of the number of enquiries were tracked using the website's backend database. A right-tailed, two-proportion z-test was conducted ( $z = 38.4$ ,  $p < 0.00001$ ).

their original decision and instead select a model with the tag. We hypothesized that the addition of a social proof tag to certain bike models would significantly change consumer consideration of said models. This was assessed by tracking average daily visits via the catalogue page.

We tracked the metrics on three separate models of motorcycles, Model A, Model B and Model C. Metrics were tracked daily from 18 December 2023 to 17 February 2024 for a total of 62 days. Data collected between 18 December 2023 – 16 January 2024 (30 days) was considered the control condition, and data collected between 19 January 2024 and 17 February 2024 (30 days) was considered the experimental 'Social Proof Tag' condition. Changes to the website were made between the two time periods, on 17 and 18 January 2024.

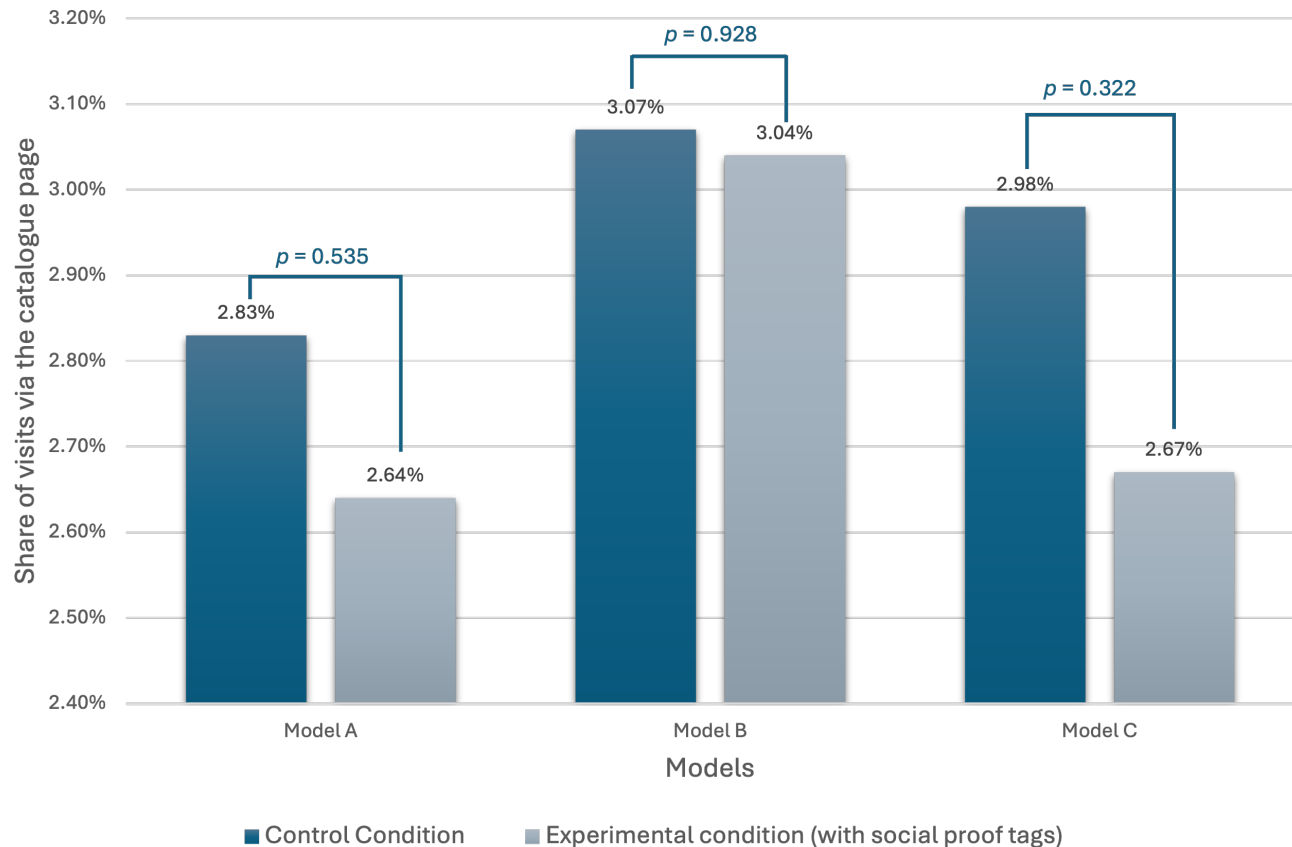
We conducted a two-tailed, two-proportion z-test for each bike model to compare the average daily visits via the model page as a proportion of the average daily visits to the catalogue page (Figure 2). This helped isolate the variable of average daily visits to the model pages via the catalogue page from other extraneous variables that could potentially affect this, such as the total visits to the bike catalogue page. The results revealed that the 'BEST SELLER' tag was not associated with a statistically significant change (at the  $p < 0.05$  level) in the visits made by users to the model page of tagged bikes as a proportion of visits to the catalogue page (two-tailed, two-proportion z-test, Model A:  $z = 0.6$ ,  $p = 0.535$ ; Model B:  $z = 0.1$ ,  $p = 0.928$  and Model C:  $z = 1$ ,  $p = 0.322$  respectively). The hypothesis was not supported by our data.

### The Effect of Social Proof Tag on Consumers' Choice of Color for Scooters

We then investigated the impact of a social proof tag on a high-stake decision of the choice of colour in the 'booking' of a scooter, which is a payment of ~5% of the vehicle price made by customers to reserve a place for them in the purchase waitlist. This experiment was carried out to explore a tangible, economic decision as individuals in addition to the analysis carried out in the prior experiment. We hypothesized that the addition of a social proof tag ('Most Popular') to a non-default color would result in an increased proportion of bookings of the same color as compared to when it was the default color.

We tracked the metrics on two separate models of scooters, Model P and Model U, daily from 27 December 2023 to 26 January 2024, a total of 31 days. Data collected between 27 December 2023 - 10 January 2024 (15 days) was considered the control condition and data collected between 12-26 January 2024 (15 days) was considered the experimental 'Social Proof Tag' condition. Changes to the website were made between the two time periods, on 11 January. Model P had a total of three colors, 'IM' (Indigo Metallic), 'BB' (Brooklyn Black) and 'HN' (Hazelnut) whereas Model U had a total of four colors, 'IM', 'BB', 'MCG' (Matte Coarse Grey) and 'CW' (Cyber White).

For the control condition, the default color for Model P was 'IM' and for the social proof tag condition, the default was changed to 'BB' and 'IM' was marked as the 'Most Popular'. A right-tailed, two-proportion z-test on the Model P showed that the removal of the default state coupled with the addition



**Figure 2: The effect of the social proof tag on the visits to a bike model's page.** Visits to a bike model's page as a percentage of the total visits to the catalogue page. The visits to the bike model pages via the catalogue page as a proportion of the total visits to the catalogue page were tracked and calculated using the website's backend database. A two-tailed two proportion z-test was conducted for each model.  $z = 0.6$ ,  $p = 0.535$ ;  $z = 0.1$ ,  $p = 0.928$  and  $z = 1$ ,  $p = 0.322$  for Model A, Model B and Model C, respectively.

of a social proof tag on the color had no significant effect on the bookings of vehicles with the said color as a proportion of the total bookings (**Figure 3**). Though the proportion for the said color, 'IM', increased from 0.2194 to 0.2207, it was not significant (right-tailed two-proportion z-test,  $z = 0.1$ ,  $p = 0.4627$ ).

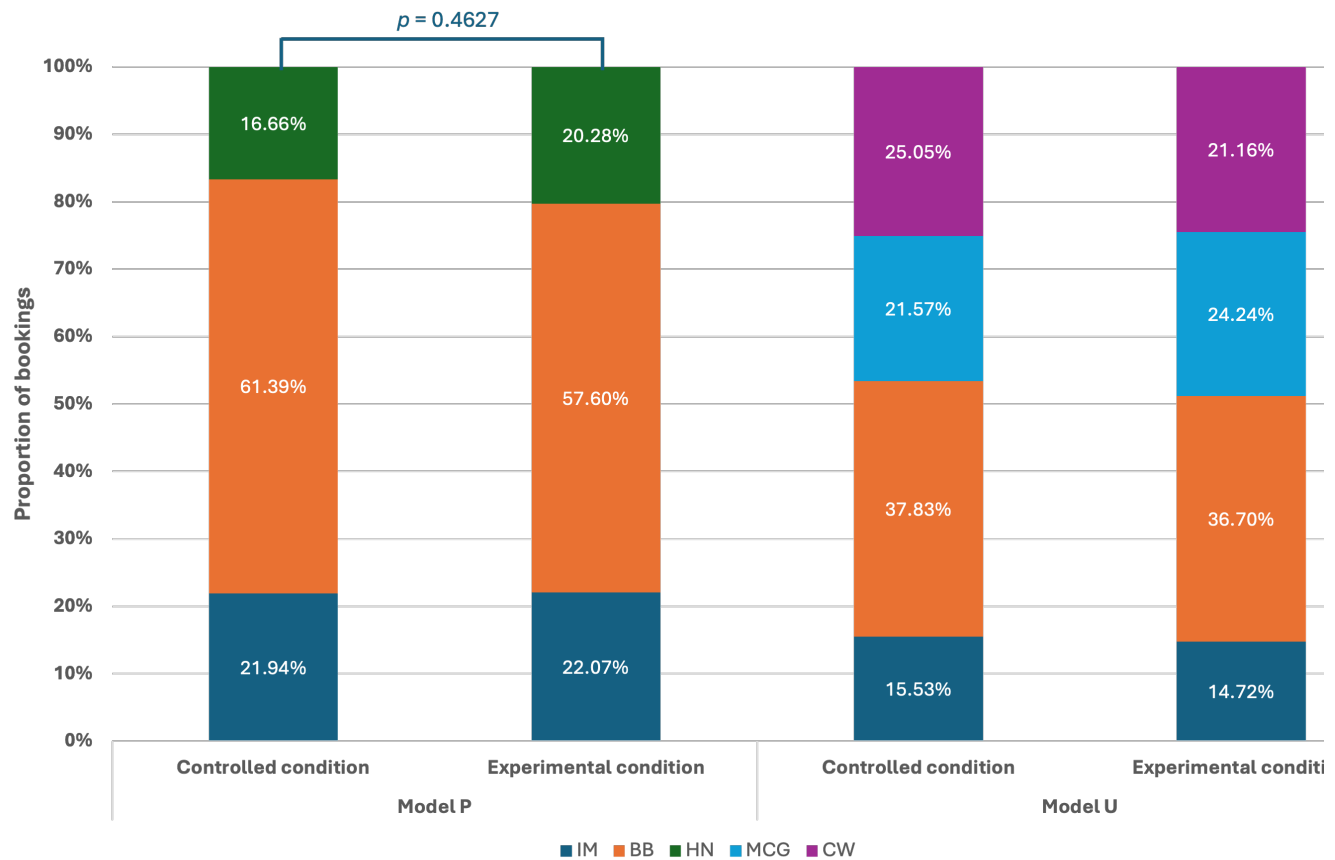
In the case of Model U, the default color was 'IM' for the control condition and for the social proof tag condition, the default was changed to 'MCG' and 'IM' was marked as the 'Most Popular'. Over the two time periods, the percentage of users booking this color dropped, which contradicted our hypothesis (**Figure 3**). Since there was no significant increase in the proportion of bookings of the color 'IM' with the social proof tag on either Model P or Model U, the data did not support the hypothesis.

## DISCUSSION

Our findings highlighted the potential impact of default opt-ins and social proof tags on consumer decision making. In our experiment on default options and their influence on conversion rates for booking test rides, the default opt-in led to a statistically significant increase in conversion from enquiries to test rides (TR%), supporting the hypothesis that default effects can influence high-stakes decisions. In our experiments on the influence of social proof tags on high-stake decision making,

we received no significant results despite some indications that these tags can affect consumer choices.

The findings from the first experiment suggest an association between a nudge in the form of a default opt-in within the test ride form and an increase in the test rides booked by users as a proportion of total enquiries. Users in the 'active opt-out' condition were more likely to submit the form than those presented with an 'active opt-in' condition. This supported the hypothesis that default effects in the form of default opt-ins may influence high-stake decision-making involving high opportunity costs, such as those involving test rides. This finding could be utilized by businesses across the world to influence consumer decision-making in a positive manner, especially in the context of sustainable consumption and charitable donations. For instance, the use of default opt-ins to environmentally friendly packaging that may be more expensive, and to small charitable donations while checking out at a store may influence a greater number of consumers to utilize those services than if they had to manually opt-in. Further research regarding the true efficacy of such changes in the choice architecture may be explored, such as the percentage of individuals visiting the showrooms for their test ride appointment times. This is necessary to conclude whether the change in the choice architecture truly leads to a change in behavior rather than just a consideration of such behavior.



**Figure 3: Influence of social proof tag on color choice measured via online booking page of a scooter (Model P and Model U).** Stacked bar charts showcasing total bookings of Model P ( $n = 4103$ ) and Model U ( $n = 9757$ ) as well as the share of bookings with each of the five colors, IM, BB, HN, MCG, CW during both the controlled condition (27 Dec 2023 – 10 Jan 2024) and experimental condition (12 Jan 2024 – 26 Jan 2024). The increase in proportion of bookings of the color with the social proof tag, 'IM' was not significant in the case of Model P (right-tailed two-proportion z-test,  $z = 0.1$ ,  $p = 0.4627$ ). In the case of Model U, the proportion of bookings of the color with the social proof tag, 'IM' dropped.

We analyzed the strength of social proof in the form of tags, both in the second and third experiments as “BEST SELLER” and “Most Popular” respectively. The z-tests conducted on the data acquired from second experiment showed that the social proof tag of “BEST SELLER” did not lead to a significant change on the average visits via the catalogue page as a proportion of the total visits to the catalogue page for all bike models, which did not support our hypothesis. However, there are a few possible explanations for the observed results. Firstly, it is posited that another factor affecting the efficacy of the social proof tag may be its uniqueness. Considering that on the bike catalogue page, six out of ten bike models possessed some sort of tag (either “BEST SELLER” or “NEW MODEL”), it is possible that users may not have found the tag to be necessary. Another factor may be ‘choice overload’. Providing consumers with many stimuli that incite viewing of six different options may have a negative effect on the users’ decision-making capability due to the increased burden of choices and stimuli, which could be attributed to the factor of preference uncertainty (14). Another factor not accounted for within the second experiment was that individuals visiting the catalogue page of a specific range of bikes of a specific brand may already have strong preferences with regards to their purchase; hence, the experiment on effectiveness of

social proof tags in high-stake decisions with high economic (financial or opportunity) costs may provide more conclusive results in a scenario with less preference strength and lesser interest directed towards a specific alternative before the choice is made.

Similarly, with the experiment on the influence of social proof tag on color choice during scooter ‘booking’, which involved a payment of ~5% of the vehicle price made by customers to reserve a place for them in the purchase waitlist, our data did not support the hypothesis. The z-tests concluded that there was no significant increase in the proportion of bookings made with the color ‘IM’ that had the social proof tag when it was no longer the default option. Nonetheless, the analysis of the third experiment presented interesting findings regarding the comparative effects of default options and social proof tags. Despite ‘IM’ being removed as the default option in the experimental condition with the social proof tag added, the proportion of bookings with the color increased by 0.0013 in one model and decreased only by 0.0081 in the other. There are two possible explanations for this. The first is that the negative effect of being removed as the default option is countered by adding the social proof tag, indicating a roughly equivalent impact on decision-making. To explore this relationship further, future studies could consider an experiment with four



conditions, one where an alternative is the default choice, one where it has a social proof tag, one where it is both the default and tagged as well as one control condition with none of these features. In such a case, a chi-square test may reveal the relative influence of these choice architecture elements in influencing decision making. The second explanation is similar to that in the second experiment – decisions such as these, i.e., picking a color for an automobile, involve high levels of personal preference (high preference strength) and taste which means that an experimental design may not be able to account for the personal differences across consumers within the experiment.

Over the course of conducting the experiments and analyzing results, certain limitations within the methodology were identified which are necessary to acknowledge along with the results as well as to act as guidance for future research conducted in the area. A primary limitation for all experiments was the implementation of the controlled and experimental conditions over different, non-concurrent time periods. Due to logistical and technical constraints within the website, it was not feasible to conduct simultaneous A/B testing. Moreover, all experiments were conducted within a span of 30 days or less within the holiday season (December to January) which may have influenced the data collected. Future studies should aim to implement simultaneous testing for longer periods such as a year to control for variables such as fluctuations in the popularity of specific brands or models over time. Furthermore, across the experiments, limitations surrounding the tracking of data within the website emerged. Nudges may influence the consumer's decision at a point in the future or at another webpage on the website with no natural way to link that decision to the nudge itself. Since the website is large with a lot of webpages and not all actions are tracked for the purpose of the experiment, the impact of the nudge may not be evident in the data owing to lack of access to and inability to track specific metrics on various web pages. Hence, it is crucial that future research is conducted in a manner that either comprehensively tracks actions on certain webpage(s) of a website or simply be conducted on smaller websites with webpages that have fewer possible actions in order to easily isolate variables and observe relationships in a better manner.

The findings regarding the effect of default opt-ins on the increasing conversion of users despite the high opportunity costs of a test ride are conclusive. Further research on the efficacy of the conversion from the digital choice to the real world may provide greater clarity. Additionally, research that investigates the role of preference strength in high stake decisions and the potential for utilizing both default options and social proof tags simultaneously may be beneficial to better understand the interplay of different choice architecture elements in influencing consumers' decisions with potential applications in promoting sustainable decision making on the part of consumers.

## MATERIALS AND METHODS

All changes were implemented in the user interface of the website of the two-wheeler manufacturer with help from professional developers at the organization. Data was collected from the back-end database of the website. The data was filtered for the specific timeline chosen prior to the experiments including the days within the controlled condition, the day when the changes were implemented and the days

falling under the experimental condition. Then, the statistical analyses were conducted (15).

### The Effect of a Default Opt-in on the Test Ride Conversion Rate for Bikes

In the control condition (pre-experiment), the website required individuals to manually fill out the enquiry form (lead generation form) and 'Book Test Ride' forms separately. Often, the next action taken by leads once they were reached out to was to book a test ride. Within the experimental condition, the website was manipulated so that upon submitting an enquiry form, the 'Book Test Ride' form opened with auto-filled information pulled from the previous form and a pre-selected but changeable test ride slot. This effectively opted users into the test ride by default and forced them to actively opt out by not clicking the 'Submit' button. We tracked the total number of enquiries, and the number of test rides allowed for the calculation of the test ride percentage (TR%), which is the number of test rides booked as a percentage of the number of enquiries, since test rides are considered an extension or subset of an enquiry and booking a test ride is considered to an enquiry but not vice versa. The TR% was then compared between the control condition (active opt-in) and experimental condition (active opt-out) via a right-tailed two-proportion z-test that compared the statistical significance of the change in test ride conversions as a proportion of total enquiries.

### The Effect of Social Proof tag on Consumers' Consideration of Bike Models

The tag of "BEST SELLER" was added to three specific models (labelled throughout as Model A, Model B, and Model C) within a catalogue page which displayed ten bike models from the same brand on the website. Along with the tag, there was some basic information regarding the bike and an "EXPLORE NOW" button below it, which took customers to the model-specific page on the website with additional details. Three more recently launched models already had a "NEW MODEL" tag to attract viewers. The total number of visitors to the catalogue page and the number of clicks on each model were measured to track the percentage of clicks on a specific model. Two-tailed two-proportion z-tests were conducted for each bike model to compare the average daily visits to the bike model's page via the catalogue page as a proportion of the total average daily visits to the catalogue page, which helped isolate the variable from other extraneous variables that could potentially affect this, such as the total visits to the bike catalogue page.

### The Effect of Social Proof Tag on Consumers' Choice of Color for Scooters

Within the booking page of scooter models, a text element with the text "Most Popular" was added next to the color which was previously the default option, while another color was marked as the default option. Since the word "Most Popular" indicates that the product has been purchased by other individuals in the recent past, it provides social proof in the form of information regarding the purchase decision of other individuals. This was tested on two separate scooter models (labelled Model P and Model U). In the control condition, the default color was 'IM' in both models with no social proof tag present. In the social proof tag condition, the default was changed to another option ('BB' for Model P and 'MCG' for

model U) and the color 'IM' which was earlier the default option, was tagged 'Most Popular'. The total number of bookings completed and the number of bookings with each color were tracked to calculate the percentage share of each color in all bookings. Then, a right-tailed two-proportion z-test was conducted to analyze the changes in bookings of the specific color in proportion to the total number of bookings made for Model P. This experimental design allowed us to see whether the influence of social proof is enough to cause individuals to change their decision from default.

**Received:** June 3, 2024

**Accepted:** August 6, 2024

**Published:** May 12, 2025

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