

The impact of car color on used car pricing: a data analysis based on BMW used cars

Meixiang Sun

University of Birmingham, Birmingham, United Kingdom

sunmx2005@163.com

Abstract. This paper examines how car colour influences used car price by analyzing BMW resale data in the United Kingdom. Although past studies have evaluated the identity of colour during consumer perception and purchase intention, little consideration has been given to resale value depending on colour in the automotive market. The main research problem is to determine if various colour tones specifically warm colours and cool colours, influence the resale rates of BMW vehicles. Studying a sample of transactions with second-hand BMW cars, the researcher finds it evident that different prices exist in terms of various colours. It is found that cars that are painted with cool colors, particularly green, are much lower in resale (price) than the neutral one (e.g., black) or the warm one (e.g., white, red). This implies that the preferences and market demand of a particular colour by buyers contribute significantly to the second-hand values. The study adds to the existing research by making empirical conclusions on the basis of an actual market analysis and presenting practical implications both to car manufacturers and to separate consumers concerning the choice of colour and resale recommendations.

Keywords: used car price, car color, ecological valence theory

1. Introduction

The knowledge of the impact of the car colour on the price of the second-hand car is of importance to the automotive industry and to the consumers. In reality, the colour makes a significant contribution towards the perceptions and resale values of the consumer, but it usually goes unaccounted for in the traditional method of pricing, which primarily deals with the mileage, age, and engine power. This study can shed light on empirical findings of the correlation between colour and pricing to offer practical consumer aspects on how people make rational purchases, dealers can enhance their supply structure of colour and second-hand sites can enhance the real-time transparency of pricing.

Further studies on how colour influences price could be determined by the increased variety of consumer tastes, the emergence of new vehicles being powered by different types of energy, and the emergence of data analytics in the future. As an illustration, one can mention that the colour as a particular niche can become popular in particular market segments, whereas data-driven models are likely to involve colour as one of the variables that enhance the quality of valuation. This study thus not only seals a gap in the literature, but it also provides useful market players and policy makers with references. The possible obstacles, like regional variations in colour preferences or low samples in hard-to-find colour can be overcome with the help of powerful modelling practices, vast data sets, and publishing upgrades. In general, this subject is theoretically and practically valuable to the learning of any typicality of prices in the second-hand car market.

2. Literature review & theoretical foundation

2.1. Color classification and consumer perception

There are two broad categories of the color classification: warm and cold color tones, each carrying different psychological connotations that affect consumer perceptions. Warm colors are the ones whose wavelengths are longer and perceived to be cooler, and the cool ones are those whose wavelengths are shorter and whose presence evokes the feeling of coolness [1]. Warm tones that are connected to excitement, stimulation, and urgency are largely implied in marketing or consumer research, and cool tones are likely to produce a sense of calm, trustworthiness, and reliability [1].

An example is packaging research, which has discovered that products packaged in cool colors make consumers perceive them as healthier and more rational at the same time that warm-colored packaging can arouse and attract more attention [1]. Such perceptual associations are important in any market where consumers make their perceptions with respect to types of cars, like the used-car market: the car painted in a warm, warm color may subconsciously suggest energy or sportiness, and thus may justify a higher price, whereas the cool-toned car may subconsciously signal stability and prudence, and thus may be able to buy more of.

2.2. Color psychology and consumer perception

Colour psychology has a great influence on the consumer judgements of the second-hand car; this can affect both emotional reactions and price expectations. Heavy reliance on colour signals among buyers in used car marketplaces whenever limited technical information is present in the market warrants the discounting of uncertainty [2].

Cool colors, such as blue, white, and silver, are usually associated with reliability, calmness, and modernity. These associations result in more trust and quality of vehicles that may be valued higher by their prices. Conversely, warm colour such as red and yellow create excitement and could decrease the perceptions of seriousness and stability in the long run. Liu and Cheng found that colour preference has a significant impact on consumers trust, value perception and perceived product quality with the cool and neutral hues resulting in a higher level of confidence and lower risk perception of the products compared to bright or warm colours [3]. Likewise, Kumar and Garg have found that, seen as less risky and more steady in value, neutral and cool colours have been reported to be associated with a lower depreciation rate, whereas bright or unusual colours are commonly associated with higher depreciation rates [2].

Colour also influences cognitive judgments on quality and risk. The less vivid and saturated colours, i.e., black or dark grey, convey power and longevity, whereas non-standard or gaudy colour tend to create suspicions of a car in rough shape or incapable of resale. Such perceptions dictate the behaviour of negotiation and end result prices. In general, the cool and neutral colours will make the image perceived to be more valuable and aid the increase in prices, as opposed to warm or niche ones, which are likely to prompt discounts because of the tendency to perceive higher risks.

2.3. Mechanism of color influence on used car pricing

2.3.1. Application of Ecological Valence Theory

Colour influences second-hand car prices through both emotional association and thinking processes. Two theories, Ecological Valence Theory (EVT) and Processing Fluency Theory, can help explain the role played by colour preferences of consumers in affecting their readiness to pay in the resale market.

A recent study has revolved around the insights of EVT, with the aim of proving that culture-specific and environmentally specific associations shape the colour preferences of consumers. Schloss and Palmer discuss that people form tastes in colour based on the mean level of valences in their experience with such colours, which results in consistent emotional reactions that contribute to their ratings of coloured things [4]. As an illustration, white is commonly linked to clean, black to posh, and red with vigor or excitement, which would result in positive affective reactions. Oppositely, green is associated with negative feelings like mold or decay that make it less desirable in the consumer context.

2.3.2. Application of the Processing Fluency Theory

Processing Fluency Theory explains how the speed or ease of processing an information stimulus influences affective responses and evaluative judgments. In the automotive context, more common warm and neutral colors (e.g., white, black, and red) have been found to be more perceptually fluent (easier for consumers to visually process) than less common cool colors (e.g., green). This difference in perceptual fluency may influence consumers' emotional reactions, decision-making, and how much consumers are willing to pay for used vehicles.

According to Reber and Unkelbach, processing fluency is an important epistemic cue in human judgment [5]. Overall, when participants are presented with stimuli that are easy to process, they are more likely to evaluate them positively, and when they are presented with stimuli that are hard to process, they are less likely to evaluate them positively [5].

Schwarz et al. further argue that fluency functions as metacognitive information: when something "feels fluent," people misattribute that ease to liking, truth, or quality. This mechanism is particularly relevant in consumer contexts, where design, colour, or layout can subtly influence preferences and choices through processing ease [6].

For example, in car purchasing, specifically, the green color, which is not a mainstream color, can create perceptual disfluency when compared to the expected mainstream color and lower affective evaluations and price offers [7]. Applying this theory to the market of used cars, which colour types are on average valued higher than others: warm or neutral cars are higher

than cool coloured cars, since the color spectrum is wider. Warm and neutral colors are more common in daily visual environments and thus easier to process and are likely to generate more positive affective reactions.

Cool colours, such as green, on the other hand, are less common for vehicles, which increases cognitive effort and decreases visual fluency. This minimal processing friction can be a factor in decreasing liking, trust, and willingness-to-pay. Furthermore, the anticipated-experienced fluency correspondence is of great significance. Basic colour like white, black, and red are often anticipated by consumers to "look right".

With them, the assessments are still high. But then if they come across an unusual colour, the unanticipated disfluency can have an adverse effect on their judgments even if they cannot find a conscious explanation for it. This process is one of the reasons that price differentials in the second-hand car market are often systematic: those cars that are less fluent in colour tend to be offered at a lower price.

3. Case study

Car color has a meaningful effect on second-hand car prices because various colors have their own unique perceptual and emotional meanings regarding consumer preferences and second-hand car resale value expectations. Working on the "Predicted Price by Color (baseline)" graph, there are some very visible differences in the predicted resale prices based on color. As shown in Figure 1, orange and beige colored cars achieve the highest predicted prices, in excess of 20,000 pounds; green cars, at about 8,000 pounds, the lowest. Middle ranges of prices between 14,000 and 17,000 are seen for black, blue, silver, and grey. Red and grey are more varied but are higher than green. This is the case with car colour because it is visible and a psychologically loaded factor that influences consumer behaviour beyond functional attributes. The second-hand car market is large and competitive, and even small differences in buyer perception can translate into substantial differences in the price of a car. Moreover, the distribution of color varies between areas and models and thereby gained greater relevance in an analysis of color's effect on price.

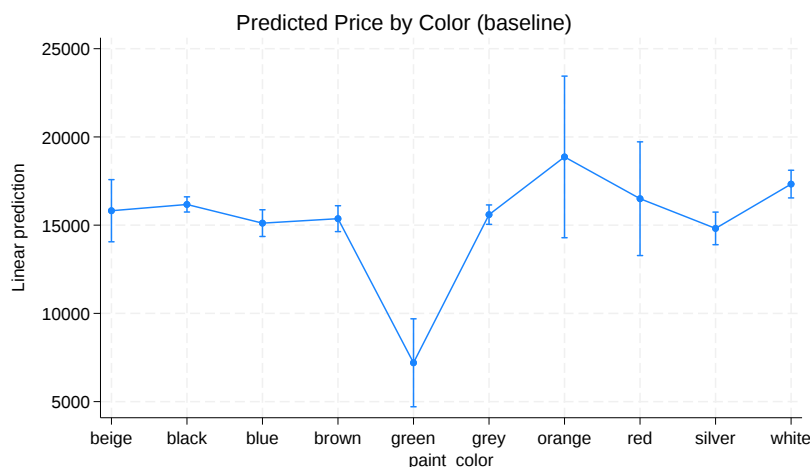


Figure 1. Price and colours [8]

These differences can be explained by colour psychology and processing fluency theory. For example, warm colours such as orange are the easiest to process visually and help create positive feelings like energy and excitement, which makes consumers more willing to pay [9]. Beige and white are associated with purity and trustworthiness and can increase the perceived value. On the other hand, the green color is related to lower popularity or styles, which have a disadvantageous influence on demand and resale price. Neutral colors such as grey and silver are seen as safe, professional, and versatile, appealing to a wider customer base. Moreover, researchers have recently found that social and psychological context affects color preferences: consumers in a state of social exclusion display a preference towards the use of warm colors due to the psychological need for self-enhancement [10]. According to processing fluency theory, easier stimuli are more positively evaluated, leading to the explanation that some colors are associated with higher price predictions [11]. Thus, price differences between colours in the second-hand car market are partly in line with psychological associations and perceptual ease as measured.

4. Conclusion

The correlation between color psychology and market pricing information is evident: warm and neutral colors, which are linked to positive emotions or high processing fluency, tend to sell for higher resale prices. EVT is also applied to explain many consumer choices, as preferences are often related to culturally shaped positive associations. However, there are some differences. For instance, some colors might have a strong aesthetic value and a weak market share because of limitations on supply or a niche demand. Processing Fluency Theory is beneficial for understanding prices for some reasons, but it also has its weaknesses: the theory does not entirely explain the economic factors such as availability, brand positioning, changing fashion trends, etc.

The cultural differences have a big influence on the color-price relationships. For instance, in the Chinese market, white is a much-cherished color due to its symbolic purity and modernity, while black and silver prevail among the Western preferences. Environmental awareness, on-trend marketing targeted at the young, and the issue of personalisation are influencing the impact of colour on resale price.

Secondhand car dealers can also utilize the knowledge of cultural and psychological color preferences when clearing prices and selecting inventory. If consumers always chose colors that were most popular, it would provide buyers with the greatest amount of resale value in the future.

References

- [1] Steiner, K., & Florack, A. (2023) The Influence of Packaging Color on Consumer Perceptions of Healthfulness: A Systematic Review and Theoretical Framework. *Foods*, 12(21), 3911. <https://doi.org/10.3390/foods12213911>
- [2] Kumar, R., & Garg, R. (2022) The impact of car colour on consumer perception and resale value: Evidence from the automotive market. *Sustainability*, 14(15), 9210.
- [3] Liu, Y., & Cheng, C. (2022). Colour preference and consumer perception: An empirical study of visual cues in product evaluation. *Sustainability*, 14(10), 6015. <https://www.mdpi.com/2071-1050/14/10/6015>
- [4] Schloss, K. B., & Palmer, S. E. (2017) An ecological framework for temporal and cultural variation in color preferences. *Journal of Vision*, 17(13), 1–23. <https://doi.org/10.1167/17.13.1>
- [5] Reber, R., & Unkelbach, C. (2020) The epistemic status of processing fluency as source for judgments of truth. *Review of Philosophy and Psychology*, 11, 611–633.
- [6] Schwarz, N., Jalbert, M., Noah, T., & Zhang, L. (2021) Metacognitive experiences as information: Processing fluency in consumer judgment and decision making. *Consumer Psychology Review*, 4(1), 425.
- [7] Song, H., & Schwarz, N. (2018) If it's difficult to pronounce, it must be risky: Fluency, familiarity, and risk perception. *Psychological Science*, 29(1), 36–47.
- [8] Kyrka, D. (n.d.). BMW pricing challenge [Dataset]. Kaggle. <https://www.kaggle.com/datasets/danielkyrka/bmw-pricing-challenge>
- [9] Dai, L. (2023) The influence of color on humans' purchasing behavior. *Open Journal of Social Sciences*, 11(11), 4458.
- [10] Zong, L. (2022) How social exclusion affects consumers' color preference. *Frontiers in Psychology*, 13, 9384841.
- [11] Alter, A. L., & Oppenheimer, D. M. (2019). Metacognitive experiences and the intricacies of processing fluency. *Trends in Cognitive Sciences*, 23(9), 798–809. <https://doi.org/10.1016/j.tics.2019.06.007>