The Effects of Nine-Ending Prices and the Need For Cognition in Price Cognition

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Research has suggested that prices that end in a nine are considered to be significantly lower than prices that are one cent higher. Building on previous research, this study investigates how the need for cognition (NFC) and cognitive effort affects the perception of nine-ending prices among consumers. The empirical results of two experiments demonstrate that consumers with a low NFC are more likely to perceive nine-ending prices to be lower than prices ending with a zero than are consumers with a high NFC.

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The use of nine-ending prices is popular among retailers. According to a previous report, 30% to 65% of all prices end in the digit nine, and evidence from an econometric analysis of UPC retail scanner data and surveys of retail price practices showed that consumers perceive nine-ending prices to be significantly lower than prices that are just one cent higher (Stiving and Winer, 1997; Schindler and Kirby, 1997; Thomas and Morwitz, 2005). This issue has attracted the interest of researchers since as early as 1936 (Ginzberg, 1936). More recently, Anderson and Simester (2003) suggested that the last digit of a price has a significant impact on receiving revenues, even though nine-ending prices change the price of products by just one cent.

Although monetary promotions such as nine-ending prices cause consumers to purchase more, some research has suggested that the effect of such prices depends on the amount of attention that consumers pay to the decision to purchase (Shindler and Warren, 1988; Zaichkowski, 1988). The amount of attention is likely to be affected by a variety of factors, including consumer involvement, motivation, and the opportunity to process price information. Another important variable that has largely been ignored in the literature is the need for cognition (NFC), which may be a crucial element that affects consumer perceptions of nine-ending prices. This research investigates the NFC as a facet of consumer personality that reflects a tendency to engage in and even enjoy evaluating prices, as it motivates comparative thought. It is proposed that consumers with a high and low NFC will exhibit different consumer behavior. The research divides consumers into two price cognition groups: high and low price cognition. Two subsequent experiments using these groups revealed that consumers with a low NFC tend to perceive nine-ending prices to be significantly cheaper than zero-ending prices.

Literature Review

Need For Cognition (NFC)

The need for cognition (NFC) is the tendency for people to engage in and enjoy thinking. Petty and Cacioppo (1986) demonstrated that the NFC is not related to the traditional conception of intelligence. Individuals with a high NFC are more likely to have a stronger intrinsic motivation to engage in cognition and to attempt to reduce any errors that they might have made. Being motivated by interest, enjoyment, or the challenge of work is termed intrinsic motivation. Individuals with a low NFC, in contrast, do not enjoy thinking.

Petty and Cacioppo (1986) indicated that the NFC is cognition to the extent that individuals engage in it on account of their intrinsic motivation. Based on this theory, numerous research associated with the NFC has verified that individuals with a high NFC possess stronger intrinsic motivation, and engage in cognition to reduce errors made when purchasing, whereas individuals with a low NFC do not enjoy the evaluation process. Park and Hastak (1994) found individuals with a low NFC to be reluctant when faced with cognitive endeavor and to prefer to avoid arduous discussions or deliberation; therefore, they tend to be easily influenced by others.

Given the foregoing ideas, we expect that the differences in consumer preferences for engaging in and enjoying relatively effortful cognitive processing of information, such as the NFC, are likely to influence the responses of consumers to nine-ending pricing tactics. In the sections that follow, we review the relevant literature and develop our hypotheses. We describe two experiments that we conducted to examine our predictions using the rightmost numerical digit (Study 1) and the leftmost numerical digit (Study 2) in a price.

Rightmost digit effect (nine-ending effects)

Previous studies have shown that consumers perceive a nine-ending price to be significantly lower than a price just one cent higher ($3.60 vs. $3.59). This pricing technique is termed “psychological pricing,” apparently because of the belief that nine-ending prices act on the consumer via “special psychological effects” (Shindler and Kibarian, 1993; Bray and Harris, 2006).

Schindler and Kirby (1997) proposed two effects to explain this psychological effect. The first is the perceived-gain effect, which refers to the perception of consumers that nine-ending prices indicate that the retailer is giving a small amount back to the consumer. For example, a consumer might interpret a price such as $29 as involving a $1 discount from $30. The second reason is termed the underestimated price effect, which refers to the perception of consumers that a nine-ending price such as $29 is encoded as $20. Both the perceived-gain effect and the underestimated price effect make the product seem much cheaper to consumers than if it carried a zero-ending price, and trigger an enhanced buyer response (Gendall, Holdershaw, and Garland, 1997).

Brenner and Brenner (1982) explained that the perceived-gain and underestimated price effects are the result of a limited capacity on the part of consumers to make a cognitive effort to focus on directly accessible information. They held that consumers who are exposed to price information store only the more valuable parts of the message they receive, in this case the first digits of a number. For example, when the price is $299, the digit 2 is more significant information than the first 9, which in turn is more significant than the next 9. Consumers therefore recall that the price is $200, then that it is $290, but rarely that it is $299. This limit on cognitive capacity explains why consumers always perceive a nine-ending price to be a cheaper price than a zero-ending price. A study based on cognitive capacity by Shindler and Warren (1998) found that the effects of nine-ending prices depended on the amount of attention consumers paid to the decision to purchase. Consumers who were under greater time pressure paid less attention to each price and were therefore more likely to ignore the rightmost digits.

In accordance with the literature, we expect the NFC to moderate the perception of price for nine-ending prices. We expect individuals with a high NFC to pay more attention to information central to the purchase decision and to engage in more thought about the decision than individuals with a low NFC. Consumers with a high NFC are only influenced by actual price discounts, whereas consumers with a low NFC are affected by discount signals regardless of actual price discounts (Inman et al., 1990). Consumers with a high NFC are therefore less influenced by marketing or psychological tactics. When consumers with a high NFC are faced with a nine-