主 論 文 要 旨

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Understanding Consumer Behavior Based on Behavioral Economics Findings: Empirical Analysis Using New Purchase Behavior Data

（内容の要旨）

The consumer model of behavioral economics, which incorporates cognitive psychology, posits that consumer decisions depend on the situation and context in which the decision is made (e.g., Dhar and Gorlin 2013). Rather than reject the consumer models of traditional economics, behavioral economics findings suggest that situational factors often have explanatory and predictive powers to better understand the behavior of real consumers. This study aimed to understand consumer behavior based on situational factors, such as 1) prior decision-making in sequential choice (e.g., Dhar and Simonson 1999) and 2) time pressure (e.g., Payne et al. 1988), which is said to arise from time constraints, among other behavioral economics findings. Observing these situational factors (i.e., prior decision-making and time constraints) surrounding consumer decision-making in the real world (rather than in the laboratory) has been difficult in the past, but it has recently become possible owing to "big data" (e.g., Bradlow et al. 2017). In this study, I investigate the relationship between consumer decision-making and situational factors by utilizing data collected through a self-payment system called smart cart as new consumer behavior data. Smart cart data is a log of consumer behavior in a store, including information such as the order in which items are purchased and the time spent at the store.

In Chapter 3, I examine whether the preference for expensive options in the focal decision is influenced by situational factors such as prior purchasing behavior. Shopping in supermarkets is considered "sequential choice" (e.g., Laran 2010). In sequential choice, prior decisions have an impact on subsequent decisions (e.g., Dhar and Simonson 1999; Khan and Dhar 2006).

In retail brick-and-mortar stores, point-of-sale (POS) data can tell us about the products purchased on a given shopping trip, but not about the order in which the products are purchased. On the other hand, when shopping with a smart cart, the purchase order of the products can be observed (i.e., prior purchased products). I have

analyzed 45,094 shopping trips by 8,924 consumers using smart carts, applying a fixed-effects logit model (controlling for heterogeneity across shopping trips), and found that consumers are more likely to choose high-priced products when they buy discounted or couponed products in advance. This suggests a psychological income effect of encountering and purchasing promotional products in advance (e.g., Thaler 1985; Arkes 1994; Heilman et al. 2002; Milkman and Beshears 2009).

In addition to the monetary budget, consumers set a "time budget," which is the amount of time they are willing to spend on a shopping trip (Hui et al. 2009). Consumers may also feel time pressure from the depletion of their budget (i.e., an increase in time spent in the store) (Hui et al. 2009). In the case of shopping with a smart cart, the time spent to reach a focal decision can be observed through time stamps (i.e., time spent in advance). Similarly, when shopping with a smart cart is analyzed using a fixed-effects logit model, it is found that shoppers are more likely to choose high-priced items when they have already stayed in the store long enough to make a focal decision. This suggests that time pressure simplifies consumers' decision-making processes and, as a result, consumers regard price as a guarantee of quality (Nowlis 1995).

Furthermore, the results of the hierarchical logit model analysis show, among other things, that consumers who were originally more likely to buy discounted products were more sensitive to time pressure.

In Chapter 4, I examine whether the sequential choice effect of prior promotional purchases (shown in Chapter 3), which encourages the selection of expensive options in subsequent decisions, is moderated not only by consumer factors but also by factors such as the store and the category in which the focal decision is being made. The impact of prior promotional purchases on subsequent decision-making is related not only to the sequential choice literature (e.g., Dhar and Simonson 1999), but also to the promotional spillover literature (e.g., Heilman et al. 2002; Janakiraman et al. 2006).

In the context of this relationship between sequential choice and promotional spillover, to examine the heterogeneity of the impact of prior promotional purchases across stores and categories, the store factor I consider is the competitive structure around the store (e.g., Hoch 1995), and the category factor is category penetration, purchase interval, and number of products (e.g., Narasimhan et al. 1996). As in Chapter 3, the results of a fixed-effects logit model analysis of

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644,557 purchases by 86,839 consumers using smart carts show that the sequential choice effect of discounts, that is, the promotional spillover effect of discounts, is stronger when shopping in stores with more competitors. The spillover effect of discounted promotions is also found to be stronger when choosing products from categories with high penetration or high-product counts. On the other hand, the sequential choice effect of price discounting (i.e., the promotional spillover effect of price discounting) is found to be weaker for product selection from categories with longer purchase intervals. I also find that these results do not necessarily hold for the sequential choice effect of coupons; coupon promotion spillovers are not heterogeneous, at least not by the competitive structure around the store, and are weaker for product choices from high-penetration categories.

In Chapter 5, I examine the time pressure effect in the context of the relationship between shopping start time (i.e., store check-in time) and shopping behavior. This analysis "elaborates" on the study of time pressure by proposing a different way to identify the time pressure effect on consumer decision making than in Chapter 3.

In addition to the sequential choice aspect, another characteristic of supermarket shopping is the repetitive experience of consumers from the past to the present (e.g., Hoyer 1984). In this repetition, consumers have a "habitual" behavior of completing tasks such as shopping at a certain time, and they may feel time pressure when shopping starts later than this time (i.e., routine; Betsch et al. 1989). A smart cart system can measure check-in time to the store and allow analysis of the relationship between shopping that starts later than routine and behavior in that shopping. I have analyzed this relationship using a fixed effects model (controlling for consumer heterogeneity) on 335,436 smart cart shopping trips by 36,359 consumers and found that the effect of time pressure on 1) time spent shopping and purchase volume, 2) category purchase behavior, and 3) product purchase behavior is significant. For example, in later-than-routine shopping, consumers 1) accelerate in-store decision-making (Payne et al. 1988; Herrington and Capella 1995), 2) rely more on visual stimuli (i.e., purchase categories with more products) (Park et al. 1989), and 3) make simplistic decisions, such as considering price as quality (i.e., purchase of high-priced products increases) (Nowlis 1995; Suri and Monroe 2003).