

# Customer Heterogeneity in Purchasing Habit of Variety Seeking Based on Hierarchical Bayesian Model

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This research presents a model which expresses product choice behavior in terms of 'inertia' or 'variety seeking' for each customer by using a mixture normal-multinomial logit model in a hierarchical Bayesian framework.

A product choice behavior is called as 'inertia' if a customer chooses the same product as the previously purchased and 'variety seeking' if it is a different product from the previous one. These kinds of behaviors are frequently observed in the product category of 'low involvement' (Dick and Basu (1994), Peter and Olson (1999) ). Consumers tend to purchase a 'low involvement' product such as beverage or cake based solely on experience, inertia, or atmosphere. In addition to 'inertia' or 'variety seeking', Bawa (1990) proposed a model for segmentation purposes. It has an additional segment of 'hybrid' customer, of which purchasing tendency changes from 'inertia' to 'variety seeking' or vice versa. Moreover, it is getting increasingly important to understand the heterogeneity of customers in recent years, particularly from the view point of the category attribute.

A comparison was made between a hierarchical Bayesian model and a finite mixture model on the product category of Japanese tea and Chinese tea. The result shows that the hierarchical Bayesian model is superior to the finite mixture model in terms of 'hit rate'. Further, the model with the variables of 'inertia' or 'variety seeking' was superior to the one without them in terms of Deviance Information Criterion, DIC. In addition, we extended the Bawa's formula on 'inertia', 'variety seeking' or 'hybrid' behavior by considering the influence of purchasing intervals. Our proposed model that considers a timing of customer's brand switching was superior to the Bawa's formula. We obtained the results that each customer has a tendency of 'inertia' or 'variety seeking' or 'hybrid' in product choice, which is different between the category of Japanese tea and that of Chinese tea.

Finally, we proposed a CRM related strategy that calculates a necessary discount rate for individual brand switching and offering the brand according to the brand switching timing of each consumer.