CS-770 Human-Computer Interaction

Assignment 2B

Introduction of concepts

This study was conducted to analyze how online grocery shopping affects the consumer's expenditure on groceries. From the earlier assignment, I hypothesized that consumer's expenditure will be lesser when they are repeat customers to a particular online shopping site and that the expenditure will be lesser when they spend a fixed or limited-time shopping online. The first concept involves noting the expenditure on groceries as a dependent variable on the mode of shopping adopted which can be either online or in-person making them independent variables. The second concept involves understanding loyalty as a factor dependent on whether they are repeat customers using the re-order option or not. The third concept is whether distraction during online shopping is a dependent factor influencing the expenditure and if shopping within a fixed time will reduce the expenditure by minimizing the distraction. A questionnaire [1] with 6 questions addressing each of these concepts was conducted and the Likert-scale was adopted for measuring their responses. The study setting included 14 participants who were above the age of 18 familiar with online shopping.

Factor Analysis

Factor Extraction

On performing extraction of factors using Principal Component Analysis, the Kaiser Criterion and the Scree test were used to determine the number of significant factors that should be retained. Based on the Kaiser Criterion, three factors were retained as their eigenvalues were 4, 3.5 and 1.3 respectively and also the Scree test visually indicated three factors with respect to the "point of inflection". Firstly, Online grocery shopping is expected to reduce the consumer's expenditure. Secondly, being a repeat customer for a particular shopping site will result in lower expenses. Thirdly, shopping within a fixed time frame can help reduce the expenditure. These predictions and hypotheses are based on personal experience and logical reasoning. However, there has been a supportive article backing these ideas [2].

Factor Rotation and Scale Construction

Loadings for each variable on each factor are calculated and factor rotation is applied using the Varimax method. Three factors as identified in the previous step is considered and the loadings for the 18 variables are calculated, thereby giving the factor matrix. Since the loading on the variables was significantly high, a cutoff of $r > 0.5$ was used for scale construction. There were 3 provisional scales identified. Firstly, the scale of online shopping is created with the items Deterrent factor, Ease of delivery, Consistency of shopping list, Absence of re-ordering as a deterrent factor, Use of re-ordering, and Reduction of impulse buying due to reordering. Secondly, the scale of loyalty is created with the items Frequency of online shopping, Frequency of in-person shopping, Loyalty with the online shopping site, Change in expenditure while shifting to a new shopping site, Watching/tracking shopping time, and Distraction during shopping. Thirdly, the scale of shopping time is constructed with the items Shopping within limited time lessens expenditure, More time leads to more expenditure, and Time is not a crucial factor affecting expenditure.

Testing Scale Reliability

The reliability of the scales was found using Cronbach's alpha. The raw alpha scores for the scales online shopping, loyalty and shopping time was found to be 0.86, 0.83 and 0.66, respectively. Removing an item from the scale of shopping time did not improve the alpha to be greater than 0.70. Otherwise, the scales were found to be conceptually reasonable and reliable.

References

[1]https://docs.google.com/forms/d/e/1FAIpQLSerRm7A0snt_i9BGXoSdYV7HZoA96Gow0FkB443z1vJlr9JZQ/viewform?usp=sf_link

[2]https://www.forbes.com/sites/gregpetro/2019/03/29/consumers-are-spending-more-per-visit-in-store-than-online-what-does-this-man-for-retailers/#a09ace575432