Experiment on consumer behaviour in fashion E-commerce – experience and insights

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As e-commerce continues to grow, so do the competition and expectations from consumers. To meet these challenges, e-tailers need to become more streamlined and understand the behaviour of their customers. An experiment was performed to gain knowledge about the impact of delivery and returns policies on consumer buying behaviour. Realistic and trustworthy results were generated by using a random sample strategy in performing a real-life experiment with actual consumers and products. Neither fictive products nor fictive consumers were used. This paper shares experiences and insights from conducting this experiment.

Experiment, E-commerce, Retail, Returns Policy, Delivery Policy

Introduction

E-commerce is a relatively new research area that had its starting point at the end of the twentieth century. The Internet is an enabler for e-commerce or the online sales channel and it is also a facilitator for a quite new research stream where academics and practitioners tries to understand the changing consumer behaviour that follows this relatively new channel. Internet is a driver of a "globalisation trend" where organisations' such manufacturers, wholesalers, distributors and retailers can operate and compete on a global basis to attract consumers. This of course has implications on how to conduct consumer research.

The purpose of this paper is to share experiences and insights from conducting an experiment on consumer behaviour in Nordic fashion e-commerce. In the online fashion channel the competition is quite fierce, but still there are an increasing number of global and local actors entering the market. To stimulate and attract consumers to their sites they offer lenient delivery and returns policies, which is likely to affect consumer buying behaviour. Thus, the following research question is posed; how do delivery and returns policies affect consumer behaviour? To achieve precision and realism of consumer behaviour a "real" experiment was considered as an advantageous and innovative approach.

Experiment design and set-up

Consumer behaviour researches are performed using various methodological research strategies. In this research we try to add on the traditional research through performing "real" experiment and analysing transactional sales data. Experimental consumer research is often performed with students in a rather limited laboratory settings or field experiments (c.f. Wood, 2001; Wang, 2009). These quasi-experiments have its merits and drawbacks, one merit is that it is possible to observe the participants and follow up on observations performing interviews et cetera. The main drawbacks are that they are fictive and as such often performed with a limited number of products and participants and therefore not representing real consumer behaviour.

This research is designed and performed using a randomised controlled "real" experiment with a random sample strategy. Among the 192,482 Swedish customers who had placed an order at nelly.com during the last 12 months and received the quarterly e-newsletter, 4,000 customers were randomly selected and divided into four groups (A, B, C and D) of 1,000 people each. The randomisation process was conducted in two stages to ensure that no systematic sampling bias occurs. The respondents were informed through the newsletter that they had been randomly selected to participate in a study concerning the company's delivery and return conditions and that the study was being performed in cooperation with senior researchers. The letter explicitly noted that the study participants only needed to use the website as usual for shopping during the experiment. Because this study was a field experiment in which the subjects were not asked to deviate from their normal behaviour, consent was implied (Zikmund and Babin, 2007). The 4,000 participating subjects purchased 4,650 and returned 841 items during the study period distributed over 1,854 orders, and 1,009 unique customers. Data were analysed with different types of regression analysis and all results are presented in Appendix 1.

Results

On average, an order in the experiment consisted of 2.51 items and each purchasing consumer placed 1.84 orders. Table 1 displays descriptive statistics for the different groups in the experiment.

Table 1 Results of free delivery and free returns

	Group A No free delivery or free returns	Group B Free delivery only	Group C Free returns only	Group D Free delivery and free returns
Ordering customers	21.8 %	26.5 %	28.2 %	24.4 %
Average value of orders	755 SEK	732 SEK	647 SEK	768 SEK
Average value of purchased items	304 SEK	288 SEK	277 SEK	288 SEK
Returned items	13.0 %	18.6 %	19.0 %	21.1 %
Average value of returned items	406 SEK	432 SEK	360 SEK	423 SEK

In Figure 1 below the main results of the statistical analysis are presented, free delivery and free returns, are both significantly associated with an increased order frequency (details see Appendix 1). Free returns are significantly associated with a decrease in the average value of orders while free delivery is not. Hence, the expected reduction in order value when returns are free is approximately 6.4 %. Free delivery and free returns are both significantly associated with a decrease in the average value of purchased items but there is no marginal effect of the simultaneous introduction of the other lenient policy. Free delivery has a marginally significant effect associated with the average value of returned items while free returns is not. Hence, the expected increase in value of returned items when delivery is free is approximately 7.3 %.

There are also some interested interaction effects, the positive effect on increased order frequency as a result of free delivery or free returns are subadditive as the marginal effect of simultaneously introducing the other free alternative appears to be negative (see Table 2 Appendix 1). There are other marginally significant interaction effects, introducing free delivery when returns are free seem to offset the decreased order value (see Table 4).

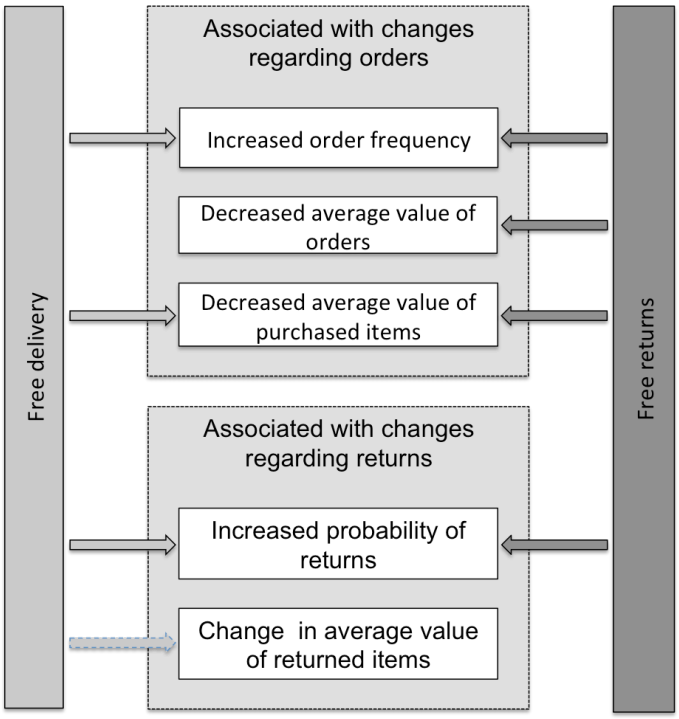

Figure 1 Main results of the statistical analysis

Concluding discussion

Conducting experiments hold great opportunities to the advancement of knowledge in understanding consumer behaviour. In e-commerce the amount of research based on experiments is limited and need to be further practiced and discussed. The experiment provided firstly, new and previously unknown relations between consumer behaviour and leniency in delivery and/or return policies. Thanks to the experiment, the relation between a free-delivery policy and various types of return behaviours where found. The "mirrored" relationship has previously been explored; however, the effects of delivery conditions on return behaviours appear to be a new finding. Second, a pattern of interaction between a free-delivery policy and a free-return policy where identified. The expected effects on consumer behaviour of one lenient policy appear to depend on whether the other policy is also lenient. This relationship has implications for the theoretical modelling of behaviour and the practical implementation of policies. Future research should consider delivery and return conditions as well as possible interactions between these factors. It is also possible that the behavioural effects discovered here differ across different types of customers. Therefore, future research should include controls for regency, frequency and monetary type variables and demographic variables such as age and gender.

Performing real life experiments using real consumers as participants when they purchase online has several strengths. Here there are no fictive products or other limitation or geographical boundaries, as it is possible to study the actual behaviour of consumers where ever they appear. It could therefore be argued that results from "real life" experiments results in a more credible and transferrable understanding of actual consumer behaviour as the study design uses random sampling of all possible respondents without any geographical boundaries. The results are also less dependent on time compared to other study designs as they can be performed in real time and analysed close to real time. In comparison with quasi-experiments and other more qualitative techniques, the "real" experimental design used in this research produce less bias regarding objectivity. The results are based on an analysis of

transactional data describing consumer behaviour as a response to the tested policy changes. Therefore the use of a random sample strategy performing “real-life” experiments with actual consumers without, neither fictive products nor fictive consumers produces both a realistic and trustworthy result.

References

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Wood, S. L. (2001). "Remote Purchase Environments: The Influence of Return Policy Leniency on Two-Stage Decision Processes." Journal of Marketing Research 38(2): 157-169.

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Appendix 1

The probability of purchase was analysed using the logistic regression model:

$$\text{logit}(Pu) = \beta_0 + FD\beta_1 + FR\beta_1 + (FD * FR)\beta_3 + \varepsilon$$

Table 2: Probability of purchase

	B	S.E.	Wald	p	Odds ratio
Constant	-1.277	0.077	278.157	< 0.001	0.279
FD	0.257	0.105	6.015	0.014	1.293
FR	0.343	0.104	10.876	0.001	1.409
FD*FR	-0.454	0.146	9.630	0.002	0.635
Nagelkerke R^2 = 0.005					

The number of orders among purchasing customers was analysed using the regression model:

$$ORDER = \beta_0 + FD\beta_1 + FR\beta_2 + (FD * FR)\beta_3 + \varepsilon$$

Table 3: Number of orders

	B	S.E.	t	p
Constant	1.798	0.093	19.325	< 0.001
FD	0.034	0.130	0.263	0.793
FR	0.041	0.133	0.305	0.761
FD*FR	0.004	0.185	0.019	0.985
F = 0.124 (p = 0.946), R = 0.019				

The order value was analysed using the semi-logarithmic regression model:

$$\log(ORDERVAL) = \beta_0 + FD\beta_1 + FR\beta_2 + (FD * FR)\beta_3 + \varepsilon$$

Table 4: Value of orders

	B	S.E.	t	p
Constant	2.747	0.017	164.876	< 0.001
FD	-0.019	0.023	-0.796	0.426
FR	-0.064	0.024	-2.689	0.007
FD*FR	0.054	0.033	1.651	0.099
F = 2.550 (p = 0.054), R = 0.064				

The value of purchased items was analysed using the semi-logarithmic regression model:

$$\log(PURITEMVAL) = \beta_0 + FD\beta_1 + FR\beta_2 + (FD * FR)\beta_3 + \varepsilon$$

Table 5: Value of purchased items

	B	S.E.	t	p
Constant	2.337	0.012	198.799	< 0.001
FD	-0.035	0.016	-2.124	0.034
FR	-0.051	0.017	-2.981	0.003
FD*FR	0.044	0.023	1.897	0.058
F = 3.523 (p = 0.014), R = 0.048				

The probability of return was analysed using the logistic regression model:

$$\text{logit}(Pr) = \beta_0 + FD\beta_1 + FR\beta_1 + (FD * FR)\beta_3 + \varepsilon$$

Table 6: Probability of return

	B	S.E.	Wald	p	Odds ratio
Constant	-1.900	0.089	452.333	< 0.001	0.150
FD	0.427	0.116	13.513	< 0.001	1.533
FR	0.450	0.120	14.029	< 0.001	1.568
FD*FR	-0.295	0.156	3.561	0.059	0.745
Nagelkerke R^2 = 0.010					

The value of returned items was analysed using the regression model:

$$\log(RETITEMVAL) = \beta_0 + FD\beta_1 + FR\beta_2 + (FD * FR)\beta_3 + \varepsilon$$

Table 7: Value of returned items

	B	S.E.	t	p
Constant	2.439	0.030	82.181	0.000
FD	0.073	0.038	1.924	0.055
FR	-0.007	0.039	-0.168	0.867
FD*FR	-0.017	0.051	-0.330	0.741
F = 2.361 (p = 0.070), R = 0.092				