Oggetto: attribuzione parti ai coautori

Con la presente i sottoscritti Francesca De Canio, Marco Ieva e Cristina Ziliani dichiarano che l'articolo negli Atti del Convegno Nazionale:
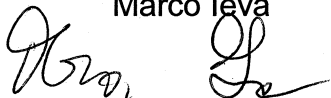
DE CANIO F., IEVA M., ZILIANI C. (2015) **Device usage patterns and online shopping behaviour, Proceedings del** *XII Convegno annuale della Società Italiana Marketing 2015, Torino 22-23 Ottobre 2015, ISBN:978-88-907662-4-4,* è frutto del lavoro di ricerca congiunto dei tre autori.

Tuttavia, in fase di stesura finale, il lavoro è da attribuirsi a Francesca De Canio per i paragrafi Introduction e 1; Marco Ieva per il paragrafo 1.1, 2, 2.1; Cristina Ziliani per il paragrafo 3.
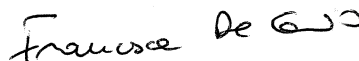
Parma, 26 Ottobre 2015

In fede,

| Marco Ieva | Cristina Ziliani | Francesca De Canio |

Il Marketing al servizio delle città
Beni culturali e rivitalizzazione urbana
XII CONVEGNO ANNUALE Torino 22-23 ottobre 2015

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Device usage patterns and online shopping behaviour

F. De Canio*[1], M. Ieva[2], C. Ziliani[2]

This study contributes to consumer behaviour and multichannel literature by exploring different device-usage patterns in online shopping behaviour. This study expands knowledge of device-usage by distinguishing between browsing and purchasing in the shopping process. E-couponing is one of the fastest growing and more relevant phenomena of e-commerce and it was chosen as field for the study because of its device-usage diversity. The study provides a segmentation of consumers in terms of the device they use for browsing and purchasing coupons online. Data were collected by means of an online survey of subjects who had shopped on Groupon, a major coupon platform, over the past year. K-means cluster analysis identified four clusters who display different device-usage patterns and also different levels of behavioural loyalty to the e-commerce platform. We found that multi-device behaviours are dominant: marketers are advised to address multi-device shopping habits with appropriate strategies. The only cluster using a single device is characterized by the exclusive use of the smartphone for both browsing and purchasing. This "Smartphone exclusive" cluster displays higher behavioural loyalty to the e-commerce platform compared to other clusters. Marketers should primarily direct their efforts to provide a seamless browsing to purchasing online experience towards the smartphone device. Limitations complete the paper.

Introduction

New digital channels are an established reality that has changed marketing and retailing practices, both on the company and on the consumer side (Verhoef, Kannan and Inman, 2015; Zhang *et al.*, 2010).

Literature on the multichannel consumer has flourished: studies of the peculiarities of multichannel consumers found them to be more valuable (Neslin and Shankar, 2009; Ansari, Mela and Neslin, 2008) and less inclined to be loyal (Konus, Verhoef and Neslin, 2008; Ansari, Mela and Neslin, 2008).

Internet-enabled devices have proliferated in recent years. Consumers use different devices to search for information, as well as to buy, and this is stimulating the development of multi-device strategies (Verhoef, Kannan and Inman, 2015; Rigby, 2011). However, very few studies have analysed the multi-device consumer.

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Literature so far has considered different channels and devices interchangeable and differences have not been explored as far as the impact of different channel/device-usage patterns on shopping outcomes.

As smartphones and tablets are growing in size while computers and laptops are becoming more portable (Stone, 2014), their role in the shopping process is likely to evolve over time (Google, 2012), leading to different patterns of device-usage by consumers for online shopping that command exploration. Insight about different customer segments, as far as device usage is concerned, is relevant for marketers to develop segment-specific marketing strategies and cultivate the loyalty of those customer segments who display more desirable shopping behaviours and attitudes (Wagner, Schramm-Klein and Steinmann, 2015).

This study attempts to segment consumers in terms of the device(s) they use for browsing and purchasing in online shopping. We found 4 clusters who display different device-usage patterns and are also related to different levels of behavioural loyalty.

E-couponing was chosen for the study as it is a growing area of e-commerce and characterized by diversity in device usage.

1. Study background

Brasel and Gips (2013) claim that research on interfaces used to browse or shop is especially relevant as interfaces are often not studied in consumer research. In fact, only in recent years there is a growing stream of studies on the effect of devices on customer response (e.g., Goh, Chu, and Wu, 2015; Xu *et al.*, 2014). For example, Wagner *et al.* (2014) explore the use of 12 different devices for online shopping. They are the first to find that consumers differ in terms of multiple device usage. Four categories of devices can be identified according to the consumers subjective perspective. Following Wagner *et al.* (2014) we focus on Laptop, Desktop, Smartphone and Tablet as these are the top 4 device-types found in their study. However, Wagner *et al.* (2014) do not distinguish between browsing and actual purchasing but explore "shopping" in general.

Coupons are promotional tools (Bawa and Shoemaker, 1987) that have traditionally been distributed with print media, such as newspapers, as well as in store. With the advent of new online channels coupons become digital and are increasingly distributed online (Blundo, Cimato and De Bonis, 2005).

Consumers collect coupons from multiple platforms, both physical and digital, and through multiple devices. The digital coupon can be seen as one of the most relevant phenomena of e-commerce (Magno, Cassia and Ugolini, 2014): 47% of consumers receive coupon directly on their smartphone (Osservatorio Mobile Marketing e Service, 2014).

Online platforms providing consumers with digital coupons have emerged such as Deal of the Day" (DoD) websites that allow customers to purchase coupons socially,

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i.e. buying together a product or service, to get a larger discount (Liang *et al.*, 2014; Hu, Shi and Wu, 2013).

Therefore, the first research question proposed in this study is: *which device do consumers use when they browse online for coupons and purchase coupons online?*

1.1 Methodology and results

To answer the above research question data were collected by means of an online survey. We draw a convenience sample from an e-mailing list of undergraduate and graduate students in Business and Economics. A total of 359 questionnaires were collected. We run the analyses on respondents (146 subjects) who declared to have previously shopped on Groupon, which is the major DoD platform in Italy with 10 million subscribers (Rusconi, 2014). Respondents were mainly females (71.2%) with an average age of 24. We asked respondents to report the share-of-time they spent browsing for coupons (as percentage of the total time spent browsing on the platform) and actually purchasing them (as percentage of the total time spent purchasing on the platform) on Groupon, separately for the following devices: Laptop, Desktop, Smartphone and Tablet.

To obtain a segmentation of our respondents we employed a two-step procedure:

    1)   To reduce the number of variables a hierarchical cluster analysis was run on the 8 share-of-time variables, resulting in 4 clusters. One synthetic variable per cluster was created.

    2)   Cluster analysis was performed on the 4 synthetic variables by means of 9 different clustering methods: hierarchical, K-means, DIANA, PAM, CLARA, FANNY, SOM, Model-based and SOTA. These clustering algorithms were run for a number of groups varying from 2 to 4. The K-means clustering algorithm with 4 groups resulted to be the best performing solution according to internal and stability indexes and to the AIC. Details on the validation measures employed are available upon request. The analyses were conducted by means of two R packages, ClustOfVar (Chavent *et al.,* 2011) e clValid (Brock *et al.*, 2008).

Table 1 displays descriptive statistics on share of time spent on browsing for and purchasing coupons per cluster.

Tab. 1 - Average share of time spent per device (in percentage) across clusters in browsing for and purchasing coupons on Groupon

Browsing	Cluster 1 "Smartphone exclusive"	Cluster 2 "Mobile lovers"	Cluster 3 "Desktop lovers"	Cluster 4 "Laptop lovers"
Laptop	7.22	13.71	15.36	59.74
Desktop	2.36	6.45	52.50	3.07

	Cluster 1 "Smartphone exclusive"	Cluster 2 "Mobile lovers"	Cluster 3 "Desktop lovers"	Cluster 4 "Laptop lovers"
Smartphone	85.56	36.67	27.09	34.47
Tablet	4.87	43.06	5.05	2.72
Purchasing	Cluster 1 "Smartphone exclusive"	Cluster 2 "Mobile lovers"	Cluster 3 "Desktop lovers"	Cluster 4 "Laptop lovers"
Laptop	7.50	16.13	15.18	83.33
Desktop	4.03	8.87	78.59	3.15
Smartphone	85.92	20.97	5.27	11.58
Tablet	2.56	54.03	0.95	1.93
N	36	31	22	57

2. Device-usage patterns and loyalty

The discovery of different clusters prompted further search for differences across clusters as far as variables of interest for marketers such as loyalty to the coupon platform are concerned. The second research question proposed in this study is therefore: *do the device-usage clusters display a different level of loyalty to the coupon platform?*

Loyalty is often measured with repeated purchase behaviour and probability of product repurchase (e.g. Lipstein, 1959; Kuehn, 1962). We measure loyalty in behavioural terms as the number of purchases made in the last year on Groupon (Coupon purchase frequency - FREQ). Frequency of online visits is one of the best predictors of online purchase behaviour (Van den Poel and Buckinx, 2005), which is positively related to customers' expected future platform patronage (Lemon, Barnett White and Winer, 2002). Recent research shows that the adoption of a mobile app leads to an increase in the probability of visiting and interacting with the mobile website (Xu *et al.* 2014). Hence, we expect that consumers that use primarily mobile devices (Smartphones and Tablet) display a higher FREQ if compared to consumers who mainly use Laptop and Desktop.

Therefore, we propose the following hypotheses:

H1a: FREQ will be higher for "Smartphone exclusive" vs. "Desktop lovers"
H1b: FREQ will be higher for "Smartphone exclusive" vs. "Laptop lovers"
H2a: FREQ will be higher for "Mobile lovers" vs. "Desktop lovers"
H2b: FREQ will be higher for "Mobile lovers" vs. "Laptop lovers".

2.1 Methodology and results

ANOVA and Post-hoc Tukey's HSD tests - which is suited to account for familywise error rate in presence of unequal sample sizes - were run to test hypotheses.

FREQ was reported to differ across the 4 clusters, $F_{(3,142)}$=3.04, p<.05. Post-hoc comparisons using the Tukey HSD test (p=.10) indicated that the mean score for "Smartphone exclusive" cluster (M=5.03, SD=6.03) did not significantly differ from "Desktop lovers" cluster (M=2.55, SD=2.69). However, the "Smartphone exclusive" cluster (M=5.03, SD=6.03) was significantly different (p<.05) from "Laptop lovers" cluster (M=2.63, SD=3.14). The "Mobile lovers" (M=3.39, SD=3.07) cluster did not significantly differ from "Desktop lovers" (M=2.55, SD=2.69), p=.87 and from "Laptop lovers" cluster (M=2.63, SD=3.14), p=.83. Hence, support was found for H1b only.

3. Discussion of results and managerial implications

Results of the present study provide several implications for consumer research and marketing strategies in e-commerce. First multi-device behaviours are found to be dominant, with only one cluster focusing on a single device. Traditional desktop use is always paired with one or more mobile devices. Two clusters are characterized by the use of three devices. It is therefore evident that multi-device habits are becoming the norm in e-commerce and deserve more attention by researchers and marketers. "Laptop lovers" are at present the largest segment and this should be taken into account when designing web interfaces for online stores.

Second, the cluster focusing on one device alone is characterized by the exclusive use of the smartphone for both browsing and purchasing. "Smartphone exclusive" display the higher behavioural loyalty to the platform. Our study extends the findings of Xu *et al.* (2014) by showing that the smartphone segment not only displays higher frequency of visit but also of purchase. This is worth exploring from an academic perspective: is it that mobile usage increases purchase frequency or is it that loyal customers tend to use mobile devices more frequently? The finding is also highly valuable from a managerial perspective: providing customers with a seamless online experience specifically for smartphones is of paramount importance for sales and loyalty. "Smartphone exclusive" loyalty is higher compared to "Laptop lovers'" but not (at .05 alpha level) compared to "Desktop lovers" loyalty. Higher portability of smartphones could be responsible for their superiority; on the other hand, with higher statistical power different results might emerge for "Desktop lovers".

In general, due to the mentioned future developments in device size, marketers should scan for migration of customers across clusters and invest in maintaining a fit between their digital assets (website, e-store etc.) and the screens that their customers, especially the most valuable ones, employ for shopping.

There are several limitations to this study. The analysis is limited to a student population of a single University. We did not intend to estimate the effect of mobile compared to other devices on behavioural loyalty, but to detect only differences across segments of customers. Finally, we measured behavioural loyalty and time spent per device by means of self-reported measures. Further studies could employ behavioural data to measure device usage and shopping behaviour and attitudinal

measures to measure loyalty. Other areas of e-commerce, different from e-couponing, could be explored.

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