Using mobile device in-store: which implications for retailers?

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***Abstract*— The widespread mobile connectivity has not only changed the way we interact and communicate, but has significantly impacted on consumer decision-making process. Consumers in a retail setting use mobile devices with different purposes: finding information on the web, comparing pricing and purchasing goods and services. Therefore, it becomes crucial to understand how the mobile influences the decision-making process as well as the purchasing decisions in-store. This topic is of great importance in grocery sector since retailers and manufacturers devote many investments in instore marketing activities with the aim to influence consumers' decisions and stimulate impulse purchases. The rise of the mobile channel has produced disruptive changes in shopping habits designed to gradually reduce the effectiveness of in-store marketing levers in influencing shopping behavior. Manufacturers and retailers are worried that the mobile could potentially distract the customer from the products and services offered within the store. Our research intends to explore the impact of in-store mobile technology use on shopper behavior instore in order to understand its effects on planned versus unplanned purchases. According to our preliminary results, consumers using mobile technology instore make less unplanned items and fail to purchase more planned items. Moreover, the use of mobile technology negatively affects shoppers' ability to recall in-store stimuli. Our findings are interesting for both retailers and manufacturers who are looking for new ways to better address their marketing efforts and increase consumers' engagement instore.**

***Index Terms*—mobile devices, in-store stimuli, unplanned purchases, shopping behavior, grocery retailing**

I. Introduction

The growing penetration of mobile devices has significantly altered consumers' behaviour and generally the way we live and work. From a simple communication device, developments in smartphone technology have changed consumers' lives, and not always for the better. Smartphone dependence has become a global phenomenon, particularly in Italy. According to a recent research [1], Italians are the first in Europe for using their mobile phone while spending time with family or friends (74%), when in a business meeting (42%) and while driving (31%). Millions of Italian consumers check their smartphones constantly, day and night and they are the first in Europe for doing so even without having heard their phones ring. The widespread mobile connectivity has not only changed the way we interact and communicate, but has significantly affected consumer decision-making process. Consumers in a retail setting use this tool with different purposes: finding information on the web, comparing pricing and purchasing goods and services [2]. Therefore, it becomes crucial to understand how the mobile influences the decision-making process as well as the buying behaviours of shoppers. Manufacturers and retailers are worried that the mobile could potentially distract the customer from the products and services offered within the store. The analysis of the factors influencing the consumer's decision making process inside the store has always interested researchers [2-9]. Nevertheless, the impact and the role of mobile technologies, such as smartphones and other mobile devices, is a subject still little explored. Along with the modernization of the retail system and the increasingly important role played by retailers in terms of consumer choices, the knowledge and analysis of what influences the shopper inside the store and how to increase demand for their product/service and brands are fundamental questions both for retailers and manufactures. The presence or absence of the shopping list and its form are variables that affect further on consumer behaviour within the store, determining the amount of planned and impulse purchases [10]. While the first are products that consumers plan to buy before entering the store, the second type defines unplanned purchases, which arise inside the store, determined by one or more stimuli [11]. Our research aims to investigate the influence of in-store mobile technology use on consumers' purchase behaviour in order to understand its effects on the in-store marketing levers managed by retailers.

II. Literature Overview

Mobile technologies can reduce search cost and improve the quality of consumer choice [12-13]. Despite the positive expectations, in many cases research acknowledges that these devices can create unintended consequences and damage the lives of individuals in terms of visual and cognitive impairments [14-15]. In particular, previous researches identify the dangerous consequences of mobile technology use while driving, discovering that people simultaneously using or conversing on a smartphone and driving a vehicle miss twice as many traffic signals as people not using a phone [14-18]. These results are consistent with psychological theories, that identify the attentional capacity as well as attentional limitations of individuals' mental system dealing with simultaneous tasks [19-

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25] and the conceptualization of distraction [14, 26-28]. Mobile use has attracted not only the greatest media interest, but also the interest of marketing scholars conscious about the effect of the widespread mobile connectivity on consumer decision-making process. Mobile technologies have been considered a resource for helping consumers make better decisions [29]. The decision making process is a complex and long path characterized by different stages which take place both in and out of store [30]: it starts when consumer's needs emerge, goes on with information seeking and evaluation of different alternatives and ends up with purchase decision and post-purchase considerations. In a retail environment, mobile devices allow shoppers to scan product barcodes, compare prices across retailers or obtain digital coupons to be redeemed in store. The usage of technologies in pre-shopping phase could help shoppers to make better decision and being less influenced by the environment while expending less effort inside the store [2]. Therefore, digital tools may have positive effects on both the quality and the efficiency of purchase decisions inside the store. Several authors investigated the role of the point of sale in consumers' decisions [6, 11, 31-33] on the belief that it was possible to stimulate purchases not planned before towards profitable products and/or categories [7]. Shoppers recognize the ability of retailers to generate immediate desires and they try to limit this effect by activating some "self-control strategies" [34-35]. The tendency of self-regulation is emphasized by the growing penetration of digital technology, which enables consumers to prepare the shopping expedition searching for product and pricing information anywhere at any time, both outside and inside the store with digital shopping list, on-line price comparison, digital flyers and apps [36]. Consequently, consumers today enter the store much more prepared than in the past, and they are able to shop quickly only looking for products they had planned to buy [2]. The degree of grocery shopping preparation is found to influence shopper behavior inside the store in terms of planned/impulse buying: the higher is the degree of preparation, the greater is the tendency to plan purchases and the lower is the tendency to make impulse purchases [2]. To conclude, the usage of technologies during the pre-shopping phase could help shoppers to make better decision and being less influenced by the environment. Such trends are designed to influence shopping behavior instore in terms of planned vs unplanned purchases [37]. Concerning with the retail setting, the distraction caused by mobile might make invisible some of the products within the store, leading to a less efficient communication and therefore to fewer impulse purchases. The role that mobile devices play in consumer decisions in a retail setting is an extremely interesting area but little explored. The role of the mobile may be different depending on the type of use that is done. In particular, we can identify two different categories: a use related to the task you are doing and, conversely, a use that is unrelated to the task [38]. In a retail setting, the task that the consumers need to do is to complete their shopping expedition, observing a precompiled shopping list, if any. Using this categorization, we can identify when shoppers use mobile in a way connected to shopping and when they use it for other activities and, consequently, to study the effects that occur in either case. In a retail setting task-unrelated mobile device use includes uses such as engaging in private conversations, sending personal text messages, checking emails, and surfing the Internet [38]. Conversely, task-related mobile device use, that is becoming particularly important in retail environments, includes uses such as comparing prices, accessing digital shopping lists, using mobile shopping applications, and calling someone for help with a decision [38]. One of the biggest differences between task-related and task-unrelated mobile device use is that consumers' expenditure of cognitive resources during task-related use is directly related to the decision task. Shoppers using devices in a shopping-related manner may better provided to track items or to evaluate spending. The amount remaining in the budget during a shopping expedition influences consumer decision making and spending [39]. As a consequence, consumers who perceive a budgetary surplus make more unplanned purchases [11]. If consumers use mobile technology in a shopping-related manner, they are able to track unplanned purchases and continuously update their budgetary figure to stay within intended spending limits. So the use of mobile phones related to shopping has the potential to help the consumer during the purchase making process. In this way, the shopper is able to identify the best substitute products over products that had planned to purchase and to avoid buying additional products not previously planned. When consumers use the mobile in a way not related to the shopping task, they will be more distracted and so the use of mobile will have a negative impact on individual decision-making process. The mobile distraction can indeed hinder the processing of information and consumer decision-making that might easily fail to purchase planned items, together with the fact that the shopper will be less influenced by the in-store communication of retailers that become less effective [28].

III. Research Aims and Hypotheses

Our study aims to investigate the influence of instore mobile use in consumer's decisions in the Italian retail context. We suppose that the growing usage of mobile technology during the shopping expedition could distract consumers who risk losing their attention towards marketing stimuli instore. Consequently, instore marketing activities might become less effective in stimulating unplanned purchases. Previous research stated the key role that in-store stimuli and displays play in influencing shoppers [7, 28, 39], acknowledged the impact that technological distraction can have on individuals' visual attention and stated the distractive nature of mobile technologies, resulting in shoppers missing in-store cues [15, 28, 40]. According to these findings, we state our first hypotheses:

H1: Consumers using mobile devices in store will be less able to recall marketing stimuli produced by retailers in the retail setting, compared to consumers not using mobile devices.

The impact of mobile devices on the effectiveness of instore communication could lead fewer unplanned purchases. These effects, however, could be different depending on the connection between the mobile and the shopping activity. In line with prior research [38], we made a distinction between consumers using

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mobile technology in a shopping related manner and consumers using mobile devices for shopping-unrelated use. We argue that shoppers using mobile device, both in a related and unrelated manner, will make fewer unplanned purchases compared to consumers not using mobile devices due to the different purchase and decision making model behind them. When used in a task-unrelated manner, shoppers will make fewer unplanned purchases because they are more distracted and they give less attention towards instore stimuli. When used in a task-related manner, shoppers will make fewer unplanned purchases because they are better equipped to stay on track during the shopping trip. Compared to consumers using mobile in a shopping unrelated manner, we expect that they will make more unplanned purchases because they are able to identify more attractive alternatives for shopping. So, the number of unplanned purchases is a result of a conscious decision due to the fact that the mobile device is enriching the decision making process. These considerations lead to the following hypothesis:

H2: Consumers using mobile technologies in a shopping-unrelated manner will be more distracted during the shopping trip and they will make fewer unplanned purchases compared to consumers not using mobile devices or using mobile devices in a shopping-related manner.

H3: Consumers using mobile technologies in a shopping-related manner will be better equipped to stay on track during the shopping trip and they will make fewer unplanned purchases compared to consumers not using mobile devices.

Mobile device use will affect unplanned purchases, but in-store mobile technology use may influence planned purchases as well. Specifically, it was stated that shopping-unrelated use may change shoppers' decisions related to planned items altering the number of items planned but not purchased. As a result, the shoppers will fail to purchase more planned items and could spend less than what they expected. Conversely, shoppers using their devices in a shopping-related manner are in a better position to identify less expensive or more attractive alternatives for planned items because the mobile device is acting as an additional tool to aid in decision making [38]. Hence, these shoppers are more likely to move away from a planned item to a superior alternative and may delay a planned purchase if a more attractive price or item is found through a different channel, for example online or at a different retailer. So, considering shoppers using their device in a shopping-related manner we could state that the number of planned but not purchased items is due simply to the fact that their mobile device is enriching the decision making process. These considerations lead to our final hypotheses.

H4 - Consumers using mobile technologies in a shopping-unrelated manner will be more distracted and they will have a great number of planned but not purchased items in their shopping list compared to consumers not using mobile devices or using a mobile device in a shopping-related manner.

IV. Methodology

To test these hypotheses, we used a single-stage mall-intercept survey method to collect data using a process similar to previous studies [8, 11, 38, 41]. A leading retailer gave us the permission to conduct our survey in its stores. We selected an Italian hypermarket store format assuming that, given its big sales area, people spend more time inside and there could be a higher probability of using the mobile. Moreover, considering the variety of the range and promotions, we can assume that shoppers are more likely use their smartphone to compare prices and search for information about products or promotions. Shoppers were intercepted after the checkout and requested to answer to a structured questionnaire. A total of 112 shoppers were interviewed, but 28 individuals were then excluded because they did not have a written or digital shopping list. Consequently, our sample was composed of 84 individuals: 86% with a printed list and the remaining 14% with a digital one. Table 1 illustrates the demographics characteristic of the sample. According to previous contributions, we first classified the mobile technology use [38]. We indicated a shopping-related usage if the respondents indicated they used their phone to compare prices of products, to create or access a shopping list, to compare different retailers for the best price, to look at a retailer's website or at a manufacturer's website, to scan a QR code on a package, and/or to call someone for help with a decision. Mobile technology use, instead, was classified as shopping-unrelated if the respondents indicated they used their phone to make or receive calls, to send and reply to personal messages, to control their social networks, to check or send emails, to look at websites not related to the shopping trip, to listen to music, and/or to play. As shows in Table 2, 28.6% of the respondents used the phone while shopping, while 71.4% did not used it. In detail, most of the shoppers (70.8%) uses the mobile device for activities not related to shopping. On the contrary, the remaining 29.2% employs mobile for a use related to the shopping experience (see Table 3). The interview focused on the stimuli produced within the store, trying to figure out whether there was a relationship between mobile usage and the memory of product promotions and advertisements displayed in the store, as well as the presence or absence of promoters. Therefore, we investigated the number of products that consumers can call to mind. Finally, it was required to customers the shopping list, if any, and the ticket, in order to calculate the difference between the number of products that they had planned to purchase but that have not been purchased and the number of excess products present in the basket in relation to the shopping list. In line with literature [38], we built two variables: the number of unplanned purchases (the number of items purchased but not planned before) and the number of items planned but not purchased (the number of items that the shopper planned to purchase before but subsequently failed to purchase).

Table 1. Demographics characteristic of the sample

Statistics			Age group				Total
			18 – 35	*36 – 55*	*56 – 65*	*Over 65*	
Gender	Women	Count	28	22	10	1	61

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		% within Gender	45.9%	36.1%	16.4%	1.6%	100.0%
		% within Age group	77.8%	75.9%	55.6%	100.0%	72.6%
	Men	Count	8	7	8	0	23
		% within Gender	34.8%	30.4%	34.8%	0.0%	100.0%
		% within Age group	22.2%	24.1%	44.4%	0.0%	27.4%
Total		Count	36	29	18	1	84
		% within Gender	42.9%	34.5%	21.4%	1.2%	100.0%
		% within Age group	100.0%	100.0%	100.0%	100.0%	100.0%

TABLE 2. MOBILE USAGE DURING THE SHOPPING EXPEDITION

		Mobile usage during the Shopping expedition	
		No	***Yes***
Gender	Women	72.1%	27.9%
	Men	69.6%	30.4%
Total		71.4%	28.6%

TABLE 3. MOBILE USAGE IN STORE

USE	**PERCENT**
1) Shopping-Related	29.2%
- To look for information and product recommendations	12.5%
- To look for information about promotions	8.3%
- To watch the shopping list	4.2%
- To make calculations	4.2%
2) Shopping-Unrelated	70.8%
- To answer or make private phone calls	49.9%
- To answer or send personal messages	16.7%
- To check the social networks	4.2%

V. FINDINGS AND DISCUSSION

Hypothesis 1 addresses the impact of in-store mobile technology on the effectiveness of instore communication. Shoppers using the mobile pay less attention to the shopping environment. Therefore, they are less prone to in-store marketing stimuli produced by the retailers. In particular, the number of promoted products that consumers could remember was on average greater for those who did not use the mobile while shopping than for shoppers who used the mobile during their shopping expedition (Table 4). Furthermore, those who did not use mobile phone had a greater memory with regard to the presence of promoters inside the store (see Table 4), and could therefore be more susceptible to a possible impulse buy. Conversely, those who used the mobile did not remember the presence of promoters and therefore couldn't even recall the brand or product promoted or communicated by the promoters in store with a number of remembered product smaller than that of shoppers who did not use mobile technology in store (see Table 4). According to Hypothesis 1, the recall, related to either the promoters than the products, is greater for shoppers who have not used the mobile during their shopping experience. Therefore, mobile devices can result in a loss of shoppers' ability to recall in-store marketing stimuli because of mobile distraction. This should be an alarm bell for the retailers, as their efforts may be ineffective. Hypotheses 2 and 3 address the impact of in-store mobile technology use on the number of unplanned purchases. Compared to shopper not using a mobile device in-store or using a mobile device in a task-related manner, we find that consumers using mobile technology in a shopping-unrelated manner made fewer unplanned purchases (see Table 5). These results provide support for Hypothesis 2 according to the theory that mobile device use consumes attentional resources and makes in-store communication strategies less effective. Moreover, our findings show that shoppers using a mobile device in a task-related manner made fewer purchases compared to consumers not using mobile devices (Table 5). These results provide support for Hypothesis 3 according to which shoppers using mobile device in a task-related manner make fewer unplanned purchases because they are better equipped to stay on track during the shopping trip. However, compared to consumers using mobile in a shopping unrelated manner, we find that they made more unplanned purchases because they are able to identify more attractive alternatives for shopping. Therefore, in this case, the number of unplanned purchases is a result of a conscious decision and not a result of a mobile distraction. Compared to shoppers not using mobile devices or using a mobile device in a shopping-related manner, shoppers using their smartphones in a shopping-unrelated manner failed to purchase more planned items (Table 6). These results provide support for Hypothesis 4: using mobile technology in a manner that is unrelated to the shopping increased planned but not purchased items. Therefore, shopping-unrelated usage may contribute to missing or forgetting planned items according to the conceptualization that the distraction of unrelated-devices use can prevent shoppers' ability to recall to their mind items intended for purchases or to read items written in their shopping list [38]. Conversely, shoppers who use the mobile device in a shopping-related manner show a marked improvement in accuracy in shopping, with a number of forgotten purchases on average close to zero. So we could state that items planned but not purchased might be a result of mobile distraction and no longer a result of a conscious decision making process. This is a potential negative outcome for consumers and retailers suggesting that shopping-unrelated mobile device may contribute to missing or forgetting planned items.

TABLE 4. IMPACT OF IN-STORE MOBILE USAGE ON THE EFFECTIVENESS OF IN-STORE COMMUNICATION

	Mobile usage	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
Can you remember some of the promotional products on display in store?	No	60	0.68	0.469	0.061
	Yes	24	0.33	0.482	0.098
How many items do you remember?	No	60	1.60	1.317	0.170
	Yes	24	0.54	0.884	0.180
Have you noticed the presence of Promoters in the store?	No	60	0.33	0.475	0.061
	Yes	24	0.08	0.282	0.058
Note: (a) F=9.401 P-value=0.003; (b) F=13.082 P-value=0.001; (c) F=5.793 P-value=0.018					

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TABLE 5. IMPACT OF IN-STORE MOBILE USAGE ON UNPLANNED PURCHASES

	Mobile Use	N	Mean	Std. Deviation
Unplanned Purchases	No mobile use	60	2.22	5.352
	Shopping related	7	1.86	3.185
	Shopping unrelated	17	0.94	3.881
Note: F=0.439 ; P-value=0.646				

TABLE 6. IMPACT OF IN-STORE MOBILE USAGE ON PLANNED BUT NOT PURCHASED ITEMS

	Mobile Use	N	Mean	Std. Deviation
Planned but not purchased items	No mobile use	60	0.17	0.717
	Shopping related	7	0.00	0.000
	Shopping unrelated	17	0.35	1.057
Note: F=0.619; P-value=0.541				

VI. CONCLUSIONS

The main goal of our work was to investigate the influence of instore mobile use in consumer's decisions in a retail context. This topic is becoming more and more interesting because of the increasing penetration of mobile technologies in consumers' everyday lives. Thus, understanding the role that mobile devices play in shaping consumer decision-making in a retail context is interesting for both retailers and manufacturers. Our findings show that shoppers using the mobile pay less attention to the shopping environment. Therefore, they are less prone to instore marketing stimuli, so they make fewer unplanned purchases. This could represent a new big treat for retailers and manufactures who devote many resources to the practice of shopper marketing with the aim to influence consumers along and beyond the entire path-to-purchase [9]. Today consumers enter the store much more prepared and they are able to make shopping quickly, only looking for products they had planned to buy, guided by a digital shopping list, digital coupons or printed customized promotions [2]. The mobile is not used only during the shopping preparation [2], but it could be use during the shopping expedition in store as a guide for the purchases. Furthermore, as emerged in our research, during the shopping expedition the mobile is frequently used for personal activities. This trend makes the threats for shopper marketing activities bigger as consumers using the mobile in a task-unrelated manner are the more distracted. Examining outcomes such as number of unplanned purchases and number of items planned but not purchased, we find that in-store mobile device use affects purchase behavior. In-store mobile technology use has significant implications for consumers and retailers including the purchase of fewer unplanned items, failing to purchase planned items, and altering the perception of in-store marketing stimuli. In line with prior research [38], the impact on unplanned purchases depends on the type of mobile device use on consumer's decisions. We find that shoppers using mobile in a task-unrelated manner make fewer unplanned purchases compared to those using mobile in a task-related manner. While these results could appear somewhat incongruent, we argue that the higher unplanned purchases made by shopper using device in a task-related manner compared to shoppers using device in a task-unrelated manner might be a result of a conscious decision making process. For task-related mobile device use, prior research identify access to information and decision monitoring as critical factors contributing to enhanced decision-making [38]. Therefore, shoppers may pass over a planned item and may decide to buy a product not planned before if they found it more attractive. These unplanned purchases may be attributed to enhanced decision making capabilities afforded by device use. These considerations are consistent with the literature according to which shoppers using mobile device in a task-related manner should be in a better position to manage and track their decisions. Conversely, task-unrelated device use negatively impact consumer decisions. In line with these results, we find that task-unrelated mobile device use is positively associated with omitted items, confirming that there is a cognitive distraction hampering shoppers' ability to make decisions. Specifically, shoppers using mobile devices appear to be distracted by the mobile technology, especially for shopping-unrelated usages. As a result, they forget to purchase some products they plan to buy and, above all, end up noticing much less the products displayed in store. For these subjects can be also noticed a reduced effectiveness of promotions and overall stimulus played in store. Finally, shoppers using their mobile phone instore, are less subject to communication and to marketing stimuli produced in the retail environment. While good for consumers, as mobile devices can potentially protect them from unplanned purchases stimulated by in-store promotions, this should be a wake-up alarm for the retailer, since its efforts could also be inefficient. Along with the reduced effectiveness of the retailers' communication, our results also suggest retailers to be careful because using a mobile device potentially results in consumers failing to purchase items that they intended to purchase and shoppers may leave planned items on the shelf and spend less overall. Retailers and manufacturers have both to face the new scenario for the practice of shopper marketing and to seek for new ways to capture consumers' attention in store, conscious that consumers are becoming increasingly reliant on digital technologies and mobile device usage in the retail context will probably increase in the next years. Considering that the more negative effects for retailers are coming from a task-unrelated manner device use (the fewest unplanned purchases and the highest omitted products), managers may be able to encourage shoppers to utilize their mobile devices in a task-related ways while shopping. This might be accomplished by creating mobile application useful for reducing the negative implications related to in-store device use.

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