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# **Internet shopping for Everyday Consumer Goods: An examination of the purchasing and travel practices of click and pickup outlet customers**

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## Title

Internet shopping for Everyday Consumer Goods: An examination of the purchasing and travel practices of click and pickup outlet customers

## Abstract

The rapid spread of click and pickup outlets in France raises questions about the implications on shopping travel behaviours. The article seeks to measure the importance of online shopping for everyday consumer goods (ECG), and to understand offline purchases and travel behaviour of click and pickup customers. The research is based on a survey conducted in 2016 among approximately 600 French households. The profile of click and pickup customers is revealed by a logistic regression. Purchasing practices and the timing of shopping activities are comprehended from cross tabulation and chi-square tests. The results show that despite the widespread use of e-commerce, shopping ECG online remains a minority practice. Using click and pickup outlets allows customers to fine-tune their purchasing, both in terms of organising their time and the retail formats they use. It enables them to adopt diversified purchasing practices that are more in line with the households' schedules and consumption requirements. Our results show that households are still committed to traditional forms of retail, for which travel remains necessary. The implications of online shopping regarding the number of trips must therefore be seen in perspective, even if our findings reveal a reorganisation of shopping, particularly concerning time.

Keywords: click and pickup, everyday consumer goods, shopping trips, schedules.

JEL classification: *D12; R22; R41.*

## HIGHLIGHTS

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- **Research question:** *What is the profile of people who shop on line for Everyday Consumer Goods? What impact does online shopping have on trip-making?*
  - **Methodology & Data:** *Our research is based on the quantitative analysis of a survey conducted in 2016 on a sample of approximately 600 French households.*
  - **Results:** *Online shopping for Everyday Consumer Goods has not been universally adopted. Click and pickup users have different shopping behaviour using this service by engaging in purchasing practices that more closely match their schedules and consumption expectations (e.g. local products, consumption of organic products, etc.).*
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## 1. Introduction

In France, the online shopping sector for Everyday Consumer Goods (ECGs)<sup>1</sup> remained very limited for a long time because the offerings were based on home delivery which struggled to attract a clientele, unlike in the United Kingdom, where delivery gained acceptance some time ago (Nielsen, 2018; Ranvier et al., 2009). But recently, the market shares of online shopping have increased, due in particular to the arrival of a more indirect method of obtaining purchases: click and pickup outlets (called *drives* in French). Created in 2004 by Chronodrive, a subsidiary of the Auchan group (a major food retailer), click and pickup outlets are rapidly spreading. Today, they number over 4000 in France (figure provided by Nielsen TradeDimensions, 2016). A click and pickup outlet consists in either a warehouse, which may or may not be adjacent to a store belonging to the same chain (a dark supermarket), or a normal supermarket, where customers go to pick up their orders. They are based on the "click and collect" principle, by which the customer places an order on the chain's website beforehand and then has to go to the click and pickup outlet to collect the order during the agreed time slot. Due to the success of its click and pickup outlets, France has caught up with other countries, with the ECG online market reaching 6.6% of the ECG total market, compared with 6.3% in the United Kingdom (figures from Nielsen Homescan, 2017).

The arrival of click-and-collect within the French retail landscape coincides with the crisis that has been affecting the mass retail sector since the end of the 1990s (Moati, 2016). Apart from the fact that they have no potential for further growth, supermarkets and hypermarkets<sup>2</sup> are affected by changes in consumption behaviour. More and more French people are expressing their weariness with ECG shopping. While in 1986, only 10% of households considered ECG shopping to be a chore, by 2010 this had risen to 21%. This increase is even more striking among women, the working population, households with children and 35-54 year-olds (INSEE, Enquêtes Emploi du Temps 1986 and 2010). This weariness feeling concerns particularly supermarkets and hypermarkets, where 61 % of French people consider shopping to be a chore (Moati, 2013). Despite that, these formats still very much dominate the retail sector, accounting for three-quarters of French people's food expenditure (Brousse et al., 2015). Indeed, supermarkets and hypermarkets have long been successful thanks to several advantages compared to other traditional retail formats. First, the "all under one roof" principle, which allows various products to be bought in a single store when they were previously sold in different stores (Moati, 2001). Second, the principle of self-service sales, which permits lower pricing (Moati, 2001). And third, their peripheral location which suits with the evolution of lifestyles, especially the development of housing in the outskirts and the diffusion of automobile-centered lifestyles (Moati, 2016). Besides, supermarkets and hypermarkets allow households to stop shopping on a daily basis and do larger shop at weekends, on Saturdays (Gallouj, 2004), since they have a car to bring their shopping back home. It was thus particularly convenient for women in a period during which women's employment rose. Actually, between 1974 and 2010, the frequency of shopping trips had decreased and the duration of shopping for those who shop on a given day had increased.

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<sup>1</sup> Everyday Consumer Goods consist of the food, hygiene and cleaning products used on a daily basis by the entire household.

<sup>2</sup> In France, a supermarket has a sales area of between 400 and 2500 m<sup>2</sup> and generates more than two-thirds of its turnover from general foodstuffs, while a hypermarket has a sales area of at least 2500 m<sup>2</sup> and generates more than a third of its turnover from general foodstuffs. The definition of sales areas varies from one country to another (INSEE definitions). These are self-service stores offering a range of predominantly food products, supplemented by a non-food offering.

Thus the time budget allocated to shopping is constant, but Saturday shopping takes longer (Brousse et al., 2015).

The growth in online shopping, for ECGs as well as other types of goods, raises questions about its implications for mobility. Gaining an understanding of shopping-related trips is important because they represent a significant proportion of daily trips and are mostly made by car<sup>3</sup>. The large-scale increase in the use of ICTs (at work, for purchases or services, etc.) raises the question of the replacement of travel by ICTs, i.e. does ICT use allow people to travel less because they can work or buy at a distance? This question has been widely explored (Mokhtarian, 1990; 2002; Salomon, 1986) in the framework of a debate between the hypothesis of substitution and that of complementarity, according to which the use of ICT does not reduce the number of trips, but changes their nature or even generates new ones. This accounting approach to the links between the use of ICT and travel has been challenged because it merely involves counting the number of trips at the individual level and does not provide an understanding of how the use of ICTs changes the nature and organisation of travel (Aguiléra et al., 2012). This approach also neglects the multiple roles of ICTs which combine and operate in multiple directions (Mokhtarian & Tal, 2013). ICTs affect travel behaviour, not only by reducing the number of trips, but by changing its patterns, but also traveling experience and the perception of travel costs (Cohen-Blankshtain & Rotem-Mindali, 2016). Moreover the impact of travel on ICT use should not be forgotten, since it is a two-way relation (Choo & Mokhtarian, 2007; Nobis & Lenz, 2009). Consequently, an alternative approach is to understand the role ICTs play in the spatial and temporal reorganisation of household activity schedules, which in turn has impacts on the location, timing and frequency of trips (Aguiléra et al., 2012). This paper thus addresses the impact of online shopping on travel by understanding the organisation of purchasing practices in space and time.

While these issues have been the subject of research, in the case of other types of goods, the development of ECG online shopping and click and pickup raises new questions about the implications of e-commerce on purchasing and travel practices. On the one hand, ECGs are specific types of goods which require frequent, regular trips, and some of which need temperature control. The results obtained for other goods, such as cultural products or intangible goods, are therefore not directly applicable to this sector. On the other hand, click and collect appears to be a particularly interesting form of e-commerce to study because, unlike home delivery, it requires customers to travel. This means that although households cannot eliminate a trip, we can expect click and pickup use to be accompanied by the reorganisation of purchasing and travel practices. It is therefore through the specific case of click and pickup that we will seek to establish to what extent the use of online shopping reshapes mobility, by examining more specifically the timing of shopping activities. This research is based on an ad hoc survey dating from 2016 and seeks to better characterise the inroads that have been made by click and pickup and quantify its importance, with a view to understanding the links between the use of click and pickup outlets and other shopping practices that do not involve the Internet, and to identify the travel associated with it, particularly with regard to the timing of shopping activities. After a literature survey, the paper presents the methodology implemented in the research. Then the results are explained and discussed before the conclusion.

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<sup>3</sup> In France, shopping is the trip purpose that generates the second largest number of trips (19%), just behind work (21%), and 68% of the trips in question are by car (Quételard, 2010).

## 2. Literature survey

After a survey of the current state of knowledge in the area of the socio-economic determinants of online shopping, this section of the paper focuses on the links between online and in-store purchasing. We then consider how shopping for ECGs fits into households' temporal organisation.

### 2.1. *Spreading and determinants of online shopping*

Online shopping is on the rise: in 2017, 85.5% of French Internet users made at least one online purchase, which is up by 2.8 percentage points on the previous year (FEVAD, 2018). E-commerce thus accounts for 8% of all retail trade in France (FEVAD, 2018). However, these figures conceal disparities in terms of the profile of purchasers and the type of product they bought. While some Internet users buy regularly on the Internet, others do so only occasionally (FEVAD, 2018). Likewise, some products, particularly intangible goods, are more frequently purchased online than others. For example, in the tourism sector (which notably includes accommodation and transport reservations), the Internet has a market share of 44% (FEVAD, 2018).

This increase is mainly due to better geographical coverage by the Internet<sup>4</sup> and greater access to digital devices. In France, among individuals, the level of computer ownership, Internet access and smartphone use is still increasing, even if the ownership of these digital devices is still confined to certain groups. For example, having a computer in one's home is dependent on age, income and educational attainment (Croutte et al., 2017). The so-called first-level digital divide (which involves Internet access) is therefore declining. However, a so-called second-level digital divide exists alongside the first and is the result of differences in Internet use. This divide is rooted less in the socio-demographic characteristics of individuals than in their cognitive ability to use the Internet (Guel et al., 2005). It is particularly marked for online shopping, which depends greatly not only on the Internet user's experience but also on his or her social environment (Guel et al., 2005). In addition to a lack of experience on the Internet and not having friends or family who are acquainted with online shopping, the Internet itself can be a source of reluctance. The main obstacle is the security of payments, especially for older people and those with few or no qualifications (Croutte et al., 2017)

In the particular case of online ECG shopping, other reservations come into play that explain the slower rise of e-commerce in this sector. They relate to the purchase of fresh produce, such as fruit, vegetables, meat or fish, where there is a sensory aspect which means consumers prefer to see, touch and smell before they buy (Geuens et al., 2003; Robinson et al., 2007). Another obstacle is the payment of delivery costs. Home delivery of food products demands particularly expensive logistics. In addition to constraints arising from the geographical dispersion of customers, there is also the need to transport fresh or even frozen products and therefore to use three-temperature trucks and insulated packaging. Address errors and missed appointments with customers are also very expensive because they require a second visit and can lead to the spoiling of goods. This cost is partly reflected in the price of the products, in particular via delivery costs (Marei et al., 2016). However, customers are reluctant

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<sup>4</sup> Both fixed-line and mobile networks are being improved, with regard to the quality of the network (the transition to 4G for example) and the coverage of dead zones (ARCEP).

to pay additional charges for the costs of the delivery service (Belton-Chevallier & Motte-Baumvol, 2014; Bitoun, 2009).

The limited take-up of online shopping prompts us to wonder about the profiles of consumers who use e-commerce, whether for shopping for ECGs or other types of products. Much research has focused on this issue. Variables such as age, educational attainment, income level and socio-occupational group are decisive. Younger individuals (Belton-Chevallier et al., 2016b; Crocco et al., 2013; Farag et al., 2003, 2006a), those who are more highly educated (Crocco et al., 2013; Farag et al., 2006a) and with medium and high incomes (Belton-Chevallier et al., 2016b; Crocco et al., 2013; Farag et al., 2006a) buy more online. In particular, these factors are conducive to the use of click and pickup (Gasnier & Raveneau, 2016; Pernot & Aguiléra, 2017).

With regard to the influence of residential location, Anderson et al., (2003) have identified two hypotheses. The first is that urban dwellers are more inclined to buy on the Internet because they are more receptive to new technology (innovation-diffusion hypothesis). The second hypothesis is that people who have less access to shops will be more likely to use online shopping, which will allow them to reduce spatial constraints and access a wider choice of products on line (efficiency hypothesis). Those two hypotheses have first been tested in the Netherlands where the results supported both hypotheses, depending on the type of products (Farag et al. 2006). More recently, the efficiency hypothesis has been confirmed by the findings of Belton-Chevallier et al., (2016b) in the French context. Online shopping is indeed more prevalent in peri-urban areas and households who reside in these areas use Internet shopping to compensate for poor accessibility to shops and services, in a desire - not always realised - to minimise their travel and save time, particularly regarding ECG shopping. In addition, click and pickup has long been offered by peripheral supermarkets and hypermarkets. This service is therefore essentially available in the suburbs, whose operation relies on car ownership (most click and pickup stores have shopping collection lanes where customers park while waiting for their purchases to be loaded directly into their car boot). This is why car-owning peri-urban residents seem to be the most likely users of click and pickup.

This time-saving strategy is all the more valid in the case of ECG shopping as more and more consumers consider it a chore and a waste of time. Such feelings are particularly strong among women, who spend more time doing this kind of shopping than their husbands (Brousse et al., 2015). According to Anquez (2004), while many women (40%) are sometimes accompanied by their spouses, this help is nevertheless occasional. In everyday life, it is largely women who shop for ECGs, and 26% of them consider it a chore and 41% an "unavoidable obligation, devoid of any interest". This burden is in addition to other domestic tasks (especially the least rewarding ones), which they still perform for the most part, although many of them are now in work (Barrère-Maurisson, 2012). Thus, whether women work appears to be a factor in favour of using online shopping for ECGs (Pernot & Aguiléra, 2017). It is also the women who decide how households organise their time, i.e. planning, organizing and coordinating family life (Meda, 2008). This is why family structure also influences online shopping. Couples seem more likely to shop on line than singles (Farag et al., 2006a), especially in the case of click and pickup (Belton-Chevallier & Motte-Baumvol, 2014). The presence of children in the household also seems to be conducive to online shopping. This can be explained not only by a higher volume of purchases but also by a more demanding schedule due to the need to make escorting trips to take children to school or out-of-school activities. In particular, having young children in the household may encourage online shopping because they require heavier and

more voluminous shopping, but also because going shopping with small children is more complicated and troublesome (Morganosky & Cude, 2000).

Thus, e-commerce customers are characterised by a specific profile that still needs further refinement in the case of ECG shopping using click and pickup outlets. Indeed, the recent very rapid increase in the number of click and pickup outlets could suggest large-scale purchasing practices that are shared by a broader population and which are less affected by the socio-demographic characteristics of the household.

## *2.2. The links between online purchases and purchases in physical stores*

The expansion of e-commerce raises questions about purchasing practices, in particular the links between online and in-store purchases. Much research has been done on this topic, some of which reopens the debate between complementarity and substitution. Do online purchases replace or complement in-store purchases, or even generate a greater volume of sales? While some research points in the direction of substitution by pointing out a decrease in the number of shopping trips (Ferrell, 2005), most studies confirm the conclusions of Mokhtarian (2004) and highlight complementarity between online and in-store purchases (Ding & Lu, 2017; Farag et al., 2007; Ferrell, 2004). However, this approach, which is based on the substitution/complementarity debate, is questionable because it is unable to consider how both the Internet and a physical store can be used in the context of a single purchase or evaluate the effect of e-commerce on total travel demand. Online shopping may generate travel for in-store shopping and in the same time, go together with less leisure trips, as time is a constrained resource (Ding & Lu, 2017).

The concept of hybridisation (Rallet, 2001) is used to refer to any retail format that uses both digital and physical functions and thus allows us to overcome the dichotomy between e-commerce and physical commerce. The hybridisation of retail formats goes together with a hybridisation of purchasing practices. The "supply routes" method (*la méthode des itinéraires d'approvisionnement*) (Desjeux, 2006) seeks to understand the process that leads to the purchase of a good (or access to a service) by reconstructing the exchanges and trade-offs that have taken place within the domestic space. The method is also based on a seven-step breakdown of the route, which ranges from the decision to buy in one's home to the disposal of the object, including travel to the place of purchase, the time of purchase, its storage, the preparation for use and use. A supply route can thus be considered hybrid when it employs both digital and physical media. Cao (2012) is particularly interested in the search for information that contributes to the purchasing decision, before the transaction. This is because the Internet makes it easier to compare prices between sellers over a wide geographical area and hence find out about different offerings before making a purchase. It can even offer better prices and allow a faster transaction, which convinces buyers to complete the transaction on line (Koyuncu & Bhattacharya, 2004). In addition, products that are not marketed in nearby stores are available via e-commerce. Thus, purchasing on the Internet provides access to more products which are not available locally, and in particular it allows peri-urban households to overcome their lack of access to shops (Belton-Chevallier et al., 2016a).

While click and pickup outlets (like home delivery) are a hybrid retail format because of the way they function (Internet orders, collection from physical stores or warehouses), hybridisation does not have the same characteristics as for other purchases. When buying an expensive and durable material good, hybridisation makes it possible to compare different



online offers, then go to stores one has pre-selected on the Internet to ask for advice from salespersons, then consult the online offers again and finally conclude the purchase in the physical store or on their website. For buying a food product, the functions defined by Rallet are simplified and hybridisation is not based on a succession of back and forth movements between the Internet and physical stores. While it is indeed possible to compare product prices between different brands, the rationales that guide food purchases are not the same as for other products. For most French consumers, they are based less on price than on product quality (Tavoularis et al., 2016), especially in view of the anticipated profile of click and pickup customers, who tend to be fairly affluent. On the other hand, the click and pickup outlets whose websites they consult must be present in their everyday environment, so this hybridisation does not allow an expansion of the ECG range available in a geographical area. However, it does allow the order to be made in digital form, which can be done from anywhere and at any time, provided that the consumer has an Internet connection. Thus, the time spent at the supermarket or hypermarket is limited to pick-up, which requires the customer to travel to the click and pickup outlet at a pre-determined time. Hybridisation therefore does not result in complete dematerialisation of the purchase or the elimination of the journey to the store, but it may lead to several types of reorganisation.

The *retail world* (univers d'approvisionnement) concept presented by Lestrade (2001) proposes a systemic approach to shopping. This concept refers to all the retail entities used by a consumer to obtain goods. But "more than a simple collection of places, retail worlds are [...] "systems" made up of retail entities whose different elements function in an interdependent way" (Lestrade, 2001, p. 345). They make it possible to consider each consumer's practices in places of purchase, by including not only spatial and temporal dimensions, but also socio-cultural ones. This approach makes it possible to consider click and pickup outlets as form of shopping in its own right whose role must be considered in the relationship to purchasing practices as a whole. This makes it possible to understand the complexity of the interconnections between the different retail formats used. The development of online shopping coincides with the diversification of the French retail sectors, within which conventional supermarkets had long occupied an important position. But nowadays, households use a larger number of retail formats than before, and visit them less often (Dembo & Duchon, 2013). In addition to the Internet offerings of mass food retailers, other retail formats are making more and more use of digital technology. In particular, short supply chains are increasingly reliant on the Internet, as evidenced by the development of the *La Ruche qui dit Oui!* distribution points, or "click-and-pickup" farm shops (Deprez & Vidal, 2016; Marei et al., 2016). Thus, the retail outlets used by consumers are gradually become hybrid through the use of online shopping, which although small-scale at the moment is expanding.

This observation takes account of the ability of consumers to take advantage of the available offerings in order to satisfy their desires with regard to consumption. It is also a sign of the demassification of consumption (Moati, 2016). As Lipovetsky (2006) has pointed out, the advent of self-service allowed consumers to become more autonomous, and thereby contributed to the individualisation of consumption practices, tastes and demands. Consumption thus became less based on the needs of the entire household and more on those of each individual. In the ECG sector, this tendency is probably not apparent as this type of shopping is conducted for the household as a whole. However, the increasingly autonomous nature of consumption seems to lead to a segmentation of expectations with regard to consumption and a diversification of shopping practices, which have become more

heterogeneous. In this context, click and pickup increases the available variety of retail formats that are available and provides households with a new way of diversifying their shopping. The hybridisation of retail worlds thus encourages greater diversity in consumption and is accompanied by mobility practices which merit description. In particular, we shall examine the timing aspects associated with hybrid retail worlds.

### *2.3. Households' shopping trips and relationship with time*

In Western societies, households' relationship with time has changed. After the Second World War, the industrial work imposes its schedules and leads to the synchronisation of social times. For Ascher (1997), this post-war industrial society was based, at the individual level, on a "segmented" temporal configuration because the various activities followed one another in distinct segments of time, around the main one consisting of work. But gradually, working time has become more flexible (staggered working hours, night and weekend work, etc.) leading to a desynchronisation of social rhythms. Relationships to time are no longer homogeneous and vary from one individual to another (Coninck & Guillot, 2013). At the household level, Ascher (1997) refers to a more "intertwined" temporal configuration because the different activities are no longer as clearly separated in time as they were previously. Work intrudes into the home, the increasing incidence of staggered working hours often leads to temporal desynchronisation between spouses (Lesnard & de Saint Pol, 2008), certain domestic tasks can be outsourced and leisure activities are taking up more and more of people's schedules... (Ascher, 1997).

In the face of desynchronised, flexible, time, individuals "are organised as much as they organise themselves" (Coninck & Guillot, 2013, p.3). They are subject to time constraints but also organise time themselves. Coninck and Guillot (2013) describe a form of individualisation of relationships with time, by which they mean that individuals, faced with the multiple constraints they encounter, modify their lifestyle, connect their activities, make compromises, etc. The relationship with time that they espouse is based on an ethical stance with regard to time, and not on the optimisation of time. They affirm a way to spend their time, despite injunctions and social norms (such as punctuality for example) but in accordance with the way they are comfortable with spending their time. As a consequence, some people are sometimes willing to spend more time on an activity in order to meet their demanding expectations, while other people do not have particular expectations on this activity and will not spend time on it. For example, some people will make a long detour in order to go to their favourite bakery while they live just next to a quite good one, even if it means they will be late at their next activity. On the contrary other people will settle for the nearest bakery. This means that relationships with time are individualised and depend on individuals' value system.

This organising activity involves, in particular, the harnessing of tools that can include ICTs. Indeed, ICTs influence individuals' relationship with time. This was established by Couclelis (2003) who developed the concept of the fragmentation of activities. Until the advent of the telephone, an activity was associated with a place and a time. For example, work took place at the workplace during working hours. The arrival of the telephone and especially the Internet has made it possible to break up activities into several stages that can be carried out from different places, at different times, on site or remotely. Thanks to the possibilities afforded by ICTs, it is really possible to work from home, or on a train or in a hotel room during a trip. The fragmentation of activities that is made possible by the use of ICTs leads to a reduction in the spatio-temporal constraints related to activities (Schwanen & Kwan, 2008) that does not simply amount to replacing a trip by ICT use. Fragmentation underlines the wide variety and

complexity of possible re-arrangements in the dimensions of space and time (Couclelis, 2004), resulting in greater flexibility in the choice of the time and place an activity is performed.

ICT use also influences the perception of time, in particular because it makes it possible to fulfil speed requirements by facilitating multitasking. According to Jaureguiberry (2003), in a study focusing on mobile phones, the latter do not just make it possible to better organise activities or increase the rate at which they can follow one another, but also to "superimpose them simultaneously" (p. 156). A time gap, between two activities for example, or waiting time may become useful because the mobile phone makes it possible to do something else at the same time and thus to superimpose a potentially useful activity on a time that would previously have been wasted. Smartphones have enhanced these opportunities since the Internet, with its plethora of possible activities, has become available everywhere, at any time. However, this use of time which was once wasted should not be over-emphasised, as has been shown by Adoue (2016) with regard to the use of the smartphone during travel. While smartphones provide greater convenience when travelling, by offering a wider choice of possible activities thereby making it possible to adapt to daily variations in transport conditions, individuals still wish to minimise travel time. It even seems that the most active smartphone users on public transportation are more critical towards transport conditions and have higher expectations for use of travel time in public transport (Julsrud & Denstadli, 2017).

Other factors also influence the perception of transport times. Connections during public transport trips, for example, i.e. changing route or line, lead to an overestimation of transport time, as does the public (rather than private) nature of the means of transport (Kaufmann, 2002). More than the speed of a means of transport, it is the quality and continuity of the time spent on it that influences the perception of travel time (Kaufmann, 2002). Similarly, shopping in a supermarket or hypermarket is a source of interruptions. The working women surveyed by Anquez (2004) criticise these large retail formats because of the amount of time spent doing nothing there: finding and returning to a parking space, browsing the shelves to find the product of the right brand, going back to find a forgotten product or waiting at the checkouts.

The very way it operates means that online purchasing dissociates ordering from collection or delivery. The Internet therefore breaks up the act of buying in both time and space. Ordering on the Internet can be done at any time and from anywhere, especially with the advent of smartphones and the development of m-commerce. It is therefore not subject to the opening hours of a store and does not require a specific trip. It can also be divided into several stages: starting during the lunch break at work, continued while travelling home and confirmed at home in the evening. Thus, fragmentation makes it possible to shift the time the order is placed to a private space, and, if so wished, superimpose it on other activities, and to limit interruptions to activity and time spent doing nothing. In this way it would help to reduce the feeling of time spent doing nothing while shopping for ECGs.

Collection at click and pickup outlets is very rapid and can therefore easily be fitted into existing trips, particularly the trip home after work (Gasnier & Raveneau, 2016). This is especially so in view of the chains' locational choices, which increasingly use time spent travelling as a means of "saving consumers time" by capturing passing trade (Bondué, 2004). Whether or not they are located next to a store belonging to the same chain, click and pickup outlets are often located along major roads. They are thus compatible with the schedules and routes of busy households by allowing them to fit their shopping both spatially and temporally into a sequence of trips (Gasnier & Raveneau, 2016). The use of click and pickup frees households from the chore of weekend shopping, providing customers with a "feeling of

saving time" (Pernot & Aguiléra, 2017). Indeed Ferrell (2004) remarks that trip chaining, combined with teleshopping (in general) are used as "travel-efficient tools" in order to shop more.

Our hypothesis is that, in a context of desynchronisation of social times that is conducive to the individualisation of relationships with time, the weekly visit to the supermarket no longer corresponds to households' complex temporal equations and shopping requires temporally individualised solutions. In this context, click and pickup may offer a way of breaking up shopping to make it more flexible so that it can better adapt to the complex and desynchronised schedules of households.

### **3. Methodology**

This research work is based on the Liv'Mob questionnaire survey. After presenting the survey, we shall discuss the statistical methods we have used.

#### *3.1. The Liv'Mob survey*

In this article, we have used the data from the survey entitled "Parcel deliveries and e-consumer mobility: characterisation of practices and flows" (Liv'Mob). This data was produced as part of the ELIPSS panel (Longitudinal Internet Study for the Social Sciences) by the Centre for socio-political data (CDSF), Sciences Po/CNRS. ELIPSS is an Internet panel that is representative of the population residing in metropolitan France. The panel members are randomly selected and are provided with a tablet and a mobile Internet subscription. Every month, they respond to surveys drawn up by researchers. An annual survey collects and updates demographic and socio-economic data.

Liv'Mob is a questionnaire survey. The 2016 survey obtained 633 responses from individuals residing in all parts of France. It focuses on online and in-store purchasing practices. The first part of the questionnaire deals with ECG shopping, i.e. the purchase of food, hygiene and cleaning products, and the second part deals with other purchases. The research presented in this article focused on the first part. The section of the questionnaire that dealt with ECG shopping included questions on the last order placed on the Internet and on purchases made offline. The latter included purchases made in shopping centres, supermarkets and hypermarkets, with no distinction between the three formats; purchases made in a smaller shop (mini-markets, small grocery store, etc.); in a hard discount store; at the market; in an AMAP<sup>5</sup>; from a catalogue, by telephone; in an organic product store; in small shops (bakery, butcher, fish shop, etc.); other.

The survey had some biases which we need to explain. The recruited individuals were between 18 and 79 years of age, so the oldest individuals were excluded from the sample. On the other hand, the way the survey is conducted, on a tablet, means that individuals had to use one; the individuals in the sample therefore have some familiarity with ICTs. Apart from recruitment, 40 individuals had to be removed from the database because they did not answer the questions on their socio-demographic characteristics: their responses could therefore not be exploited. The sample finally included 593 individuals. Based on the weighting provided by the

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<sup>5</sup> An AMAP (Association pour le maintien d'une agriculture paysanne) is a partnership between a group of consumers and a small-scale farmer. The principle is that consumers undertake to pre-finance the farmer's production at a fair price and the producer undertakes to supply the products in question. AMAPs are intended to promote small-scale organic farming.

Centre for Socio-political Data (Sciences Po/CNRS), the sample of 593 individuals can be regarded as representative of the 18-79 years old French population comfortable with ICTs and living in mainland France, although the weighting was calculated on the basis of the initial 633 individuals. Finally, 58 individuals did not answer the question on their income. Income values were therefore allocated by conducting Multiple Correspondence Analysis (MCA)<sup>6</sup>, based on the other available socio-demographic variables. The sample is presented in Table 1. The sampling unit is the individual. But since ECG are bought and consumed at the household scale, we opted for the analysing unit to be the household.

Table 1: Sociodemographic characteristics of the surveyed individuals

Variable	Modality	Percentage
Respondent's gender	Man	49.8%
	Woman	50.2%
Respondent's age	< 30 years	10.9%
	30 - 44 years	27.2%
	45 - 59 years	32.2%
	≥ 60 years	29.6%
Type of household	Single without children	25.3%
	Single with one or more children	6.1%
	Couple without children	28.8%
	Couple with one or more children	34.6%
	Complex households containing more than one person	5.1%
Number of persons in household	1	25.3%
	2	34.0%
	3	17.5%
	4	14.8%
	5 or more	8.4%
Workers in household	Man working	17.8%
	Woman working	13.9%
	Couple working	31.2%
	Nonworking couple or single	37.1%
Educational attainment (highest qualification in the case of a couple)	No qualification or Intermediate general qualification	17.3%
	Intermediate vocational qualification	19.5%
	General or vocational maturity certificate Lower tertiary education	24.6%
	Higher tertiary education	18.1%
Household's monthly net income	≤ €2000	20.5%
	€2000 - 4000	33.1%
	≥ €4000	38.4%
Households motor vehicle ownership	Yes	28.5%
	No	87.5%
	No answer	12.1%
Use of click and pickup outlet	Yes	0.4%
	No	25.4%
		74.6%

Source : Liv'Mob survey, 2016

For the last online order, eight delivery or collection locations were available: at your home, at a place of work, from a click and pickup outlet, at a pickup point, at the store reception desk, in an automated locker, at a post office, other. In this research, those households that reported that they had collected their last online shopping order "from a click and pickup

<sup>6</sup> This imputation method allows imputing an incomplete dataset when variables are categorical. In the Livmob dataset, the income, just like the other variables, is categorical. That is why we used this method using the R package missMDA to implement it. For more details, see (Josse & Husson, 2016).

outlet" were considered to be click and pickup customers. To these 139 households, 3 households were added whose responses were recoded: two households had reported that they had collected their order "at the store reception desk" after placing their order on the website of a store belonging to a large chain (which was considered to be a pedestrian click and pickup outlet), and the last household had placed their order on the Chronodrive site which functions exclusively as a dark supermarket. In the rest of this article, the term click and pickup customers therefore refers to households that retrieved their last online shopping order from a click and pickup outlet, regardless of the frequency with which they use such services, bringing the number of click and pickup customer households to 142 (150.4 households after weighting).

### *3.2. Methods used*

The profile of click and pickup customers was revealed by a logistic regression. This statistical method makes it possible to assess which variables favor click and pickup use by monitoring how one explanatory variable affects another and thus to evaluate the effect of each explanatory variable "all other things being equal". The variable to be explained is the "click and pickup customer" variable (yes/no). The tested explanatory variables were obtained from the literature on e-commerce in general (Belton-Chevallier et al., 2016b; Crocco et al., 2013; Farag et al, 2006b, 2006a; Ren & Kwan, 2009) and more particularly the literature on food e-commerce and click and pickup outlets (Morganosky & Cude, 2000; Pernot & Aguiléra, 2017). These are: age (of the respondent), household structure (a couple or single person, number of children), income (monthly for the household), income per consumption unit, educational attainment (highest for couples), socio-occupational category (of respondent), presence of a working woman, residential location (size of urban unit and type of urban area), neighbourhood issues (remoteness, lack of shops, lack of facilities: declarative variables), type of dwelling (apartment building or house, size), type of housing near the dwelling and whether or not the household owns a car.

Purchasing practices and the timing of shopping activities were also studied with reference to the retail formats used, the times, days and frequencies of purchases. For this purpose, cross tabulations were carried out in order to compare the practices of people who use click and pickup outlets with those who do not. These analyses were supplemented by chi-square tests to assess the significance of the links between two variables.

## **4. Results and discussion**

The statistical analysis of the Liv'Mob survey has provided findings concerning the individuals who use click and pickup outlets, how this use fits in with their shopping activities as a whole, as well as the timing of their various ECG shopping activities.

### *4.1. A purchasing practice limited to a specific profile*

The results of the Liv'Mob survey reveal that 25% of households have already used a click and pickup outlet. The practice is therefore becoming more widespread among the population but is still the exception rather than the rule, while the number of click and pickup outlets has skyrocketed. Moreover, all households do not use click and pickup outlets: users have a specific consumer profile. Logistic regression (see Table 2) has revealed that, typically, click and pickup outlet customers belong to a relatively young household, with a working woman

and an income level of over €1200 per month, who own a car and who live in an area where housing consists mainly of one-family dwellings.

Table 2 : The click and pickup purchasing model

Variables		Coefficien t	Standard deviation	Z value	Significance	% total sample
	(Constant)	-7.72	1.30	-5.94	***	
Respondent's age (ref: less than 44 years)	45-54 years	-1.23	0.38	-3.23	**	22%
	55 years and over	-1.83	0.41	-4.48	***	40%
Working woman in household (ref: no)	Yes	1.16	0.40	2.89	**	45%
Household's monthly income (ref: less than 1200 €)	€1200- 4000	2.74	0.82	3.35	***	62%
	€4000 and over	2.66	0.86	3.11	**	28%
Type of housing in the area around the household's dwelling (ref: apartment buildings or mixed housing)	One- family dwelling (dispersed or not)	0.77	0.36	2.14	*	60%
Car-owning household (ref: no)	Yes	3.89	1.07	3.62	***	88%
N	593					
Log-likelihood at 0	- 411.04					
Log-likelihood at constant	- 335.85					
Log-likelihood at convergence	- 252.04					
$\rho^2$	0.25 <sup>7</sup>					

The asterisks indicate the significance level: \* corresponds to a p-value  $\leq 5\%$ ; \*\* to a p-value  $\leq 1\%$ ; \*\*\* to a p-value  $\leq 0.1\%$ .

Source: Liv'Mob survey, 2016

The identified age range (under 44 years of age) is in line with previous work (Belton-Chevallier & Motte-Baumvol, 2014; Pernot & Aguilera, 2017). These are young households, whose schedules are often constrained by work and children. However, the presence of children has not been shown in this context to be significantly correlated with the use of click and pickup outlets. The result might have been different had we been able to observe the youngest children separately, but this variable was not available. On the other hand, occupational activity appears through the variable "working woman in household" which is strongly correlated with click and pickup use. More than the presence of children in the household, it is the fact that there is a working woman in the household that increases the probability of using click and pickup. Since the increase in female employment, domestic inequalities between men and women have not been eradicated. Women still spend more time than men doing household chores (including shopping), despite their occupational activities (Ricoch, 2012). It is thus women who are responsible for the difficult task of reconciling work, domestic tasks and parenting (Méda, 2008). In fact, when they have a job, it is more difficult for them to fit shopping into the domestic arrangements. The use of click and pickup outlets is therefore particularly compatible with the schedules of working women.

<sup>7</sup> " $\rho^2$  is the empirical proportion of information in the choice data (as defined by the benchmark null case) that is explained by the model" (Mokhtarian, 2016).

Those who use click and pickup are also characterised by their incomes. The lowest income bands (less than €1200) tend not to be conducive to click and pickup use. This finding may seem surprising at first glance because the prices of products in a click and pickup outlet are not higher than in physical stores, and unlike home delivery, there are no additional costs. However, all the products available in a chain's physical stores are not listed on its click and pickup website; in particular the products in the lowest price brackets are poorly represented. Higher incomes also go hand in hand with domestic computing equipment, including the ownership of smartphones and tablets that make it easier to break up the ordering process.

Educational attainment does not appear to be correlated with click and pickup outlet use. For a long time the most educated were more at ease with the Internet because they used it more for their work, but this result suggests that Internet use and the online shopping experience are now more a function of age, which confirms the findings of Guel et al. (2005).

The residential environment also has an impact on click and pickup use, as evidenced by its correlation with the type of housing in the vicinity of the dwelling. Thus, living in a neighbourhood made up of houses increases click and pickup use. In addition, car-owning households are more likely to use such facilities. While some pedestrian click and pickup outlets already existed when the survey was conducted, their number has increased since. In 2016, most click and pickup outlets could only be accessed by car. These factors, which seem to indicate that outlying areas are more favourable to click and pickup use than town centres, could change in a few years' time, when pedestrian click and pickup outlets have built up a clientele. However, the issue remains unresolved because walking customers cannot transport the same volumes of shopping as customers who drive. As a result, the purchasing and travel practices associated with pedestrian click and pickup outlets could be very different in an urban context where purchasing practices are already distinctive.

The variables relating to the remoteness of the neighbourhood, lack of shops or facilities do not appear to be significant in the model. As these variables are declarative and imprecise, they should ideally be compared with the data in the permanent database on facilities. Unfortunately this is unavailable for a large proportion of the respondents.

The profile of customers that has been identified is therefore characterised by time constraints, particularly for women, and by constraints relating to distance from shops. It is probably this combination of constraints that makes the perception of ECG shopping as a chore so pronounced in this profile (Brousse et al., 2015).

Thus, using click and pickup outlets has not yet become a widespread practice, despite what the rapid growth in their number might suggest. This type of shopping does not involve the majority of households and meets the expectations of individuals with a specific profile. And even within this profile, the practice is rarely part of a weekly routine. Only 35% of users make a weekly order, and almost the same number (36%) make less than one order a month. Halfway between weekly and occasional use, 28% of households make an order less than once a week but at least once a month. Click and pickup use is therefore associated with a variety of purchasing routines, among which occasional, or even very occasional, use is common. Consequently few households are concerned by potential changes in their travel behaviour. Many of them have an occasional or even very occasional use of click and pickup outlets. This means that households order only part of their shopping from these outlets, So this not only raises the question of the trip to the click and pickup outlet but also the question of extent to



which their use is integrated within purchasing practices as a whole. Indeed, this could have a significant impact on their travel behaviour.

4.2. *Click and pickup use, a complementary role in purchasing*

Several indicators show that click and pickup use is a complement to shopping in physical stores. Table 3 presents the percentage of the ECG shopping budget that is spent in click and pickup outlets. Not surprisingly, this percentage is higher the more frequently households use click and pickup outlets. But even among the most frequent customers (who make at least one order per week), the majority do not spend more than 40% of their budget in click and pickup outlets.

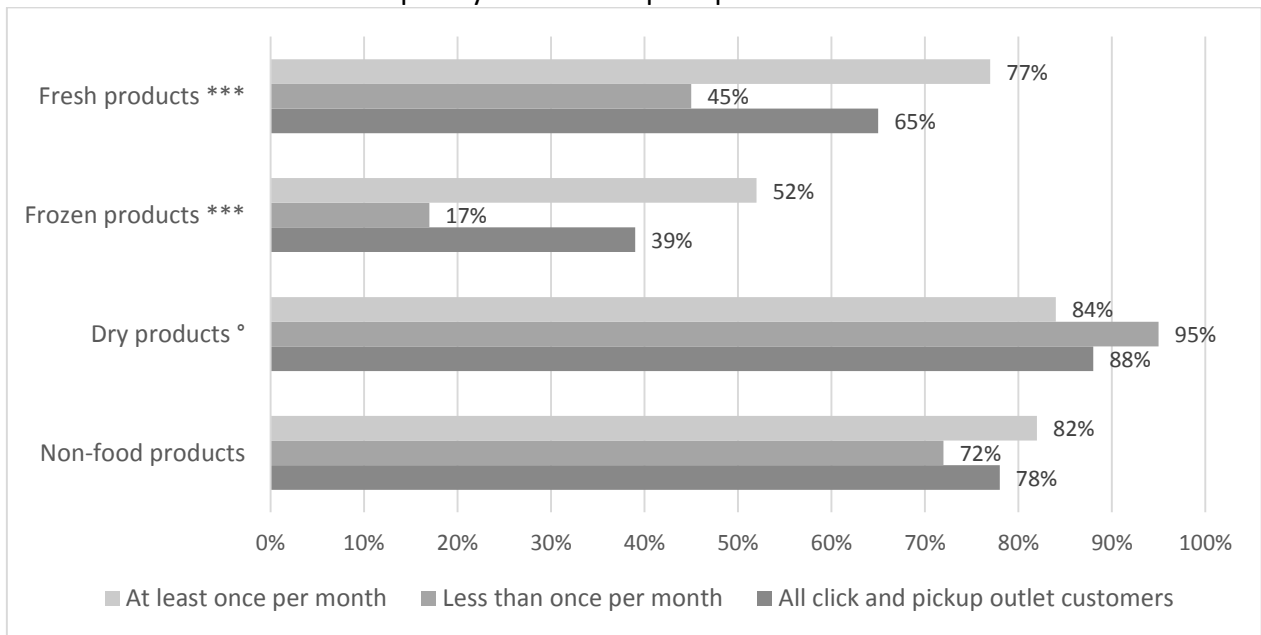
Table 3: Percentage of ECG budget spent in click and pickup outlets and the frequency of click and pickup use

Frequency of click and pickup outlet use	Percentage of ECG budget spent in click and pickup outlet		Total	Weighted total
	Less than 40%	More than 40%		
Households making at least one click and pickup order per week	53%	47%	100%	47.5
Households making less than one click and pickup order per week	82%	18%	100%	92.6
All click and pickup outlet customers	72%	28%	100%	140.1

$\chi^2$  test:  $\chi^2 = 12.222$  ; degrees of freedom = 1 ; p-value = 0.0004722  
 Source : Liv'Mob survey, 2016

This low expenditure is partly due to the reluctance of click and pickup outlet customers to buy certain products such as fresh and frozen food on the Internet. This is shown in Figure 1: while 88% of orders included dry products, only 65% included fresh products, and 39% frozen products. The category "fresh products" is probably too broad because it does not distinguish between fruit, vegetables and meat, and dairy products, for which there may be a greater willingness to buy online. These results confirm the findings of previous studies (Geuens et al., 2003; Robinson et al., 2007) that highlight the sensory aspect of shopping for these products, which consumers want to see, touch and smell before purchase or for which they want to ensure freshness and possibly check the use-by date. This means that for many customers, click and pickup outlets do not allow to shop "all under one roof" and thus require several shopping trips.

Figure 1 : Products contained in the most recent order according to the household's frequency of click and pickup outlet use



Interpretation: 77% of households shopping at least once a month at a click and pickup outlet included fresh products in their last order

$\chi^2$  test: ° corresponds to a p-value  $\leq 10\%$ ; \* to a p-value  $\leq 5\%$ ; \*\* to a p-value  $\leq 1\%$ ; \*\*\* to a p-value  $\leq 0.1\%$

Source: Liv'Mob Survey, 2016 (593 households)

Thus, the customers of click and pickup outlets need to use other stores to finish their ECG shopping. As a result, they use on average as many different types of retail formats as non-customers. Indeed table 4 shows how similar the distributions of the number of retail formats<sup>8</sup> used (other than click and pickup outlets) are, between click and pickup customers and non-customers. Moreover they proportionally use the same types of formats. This means that the use of click and pickup outlets is added to the use of other retail formats. Click and pickup outlets do not replace other types of retail format in customers' retail worlds. Consequently, their retail world counts one more format than non-customers' one.

Table 4: Distribution of the number of retail formats used other than click and pickup outlets

	Minimum	1 <sup>st</sup> quartile	Median	Mean	3 <sup>rd</sup> quartile	Maximum	Weighted total
Households who do not use click and pickup	1 format	2 formats	3 formats	3.3 formats	4 formats	9 formats	442.6
Households who use click and pickup	1 format	2 formats	3 formats	3.3 formats	4 formats	9 formats	150.4
All households	1 format	2 formats	3 formats	3.3 formats	4 formats	9 formats	593

Source: Liv'Mob Survey, 2016

Shopping frequencies in these other formats are not known. But results show that using click and pickup outlets causes households to change the frequency of their use of physical stores. The majority of click and pickup customers state that they go to supermarkets and hypermarkets less often (see Table 5). On the other hand, responses concerning the frequency of small shop use are more mixed, due in particular to a high neutral response rate, which makes the result difficult to interpret. This probably reveals different profiles among click and

<sup>8</sup> One retail format means one type of retail format. If a household uses 3 bakeries and 1 butcher's, it counts as 2 retail formats.

pickup customers, some of whom transfer their purchases (especially of fresh products) to small shops. Consequently, click and pickup customers make less shopping trips to supermarkets and hypermarkets but on the other hand, some of them make more trips to small shops.

Table 4: Opinion of click and pickup customers about two statements

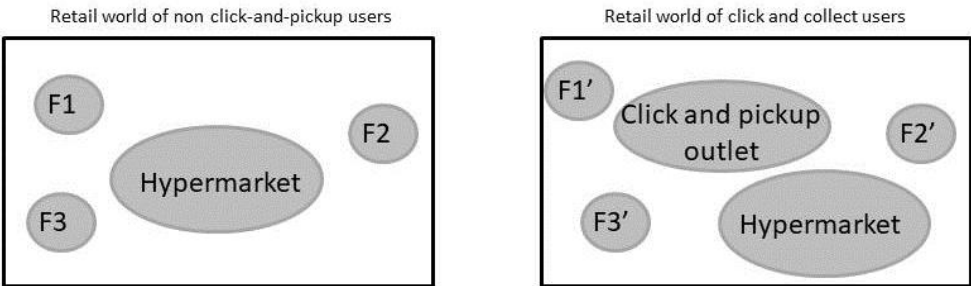
Internet shopping means you	Agree	Neither agree nor disagree	Disagree	No answer	Total
Go less often to a super-or hypermarket	72%	12%	15%	0%	100%
Go to small shops more often	43%	24%	33%	0%	100%

Source: Liv’Mob survey, 2016 (593 households)

Thus, the use of click and pickup is accompanied by restructuring of households' supply systems. The results show that click and pickup outlets play a complementary role with regard to other retail formats. They do not replace supermarkets because the vast majority of click and pickup customers continue to use them, even if they report shopping there less often. Some products that were probably purchased from the supermarket before are not included in click and pickup orders.

Since the vast majority of click and pickup customers (94% in Liv’Mob) consider that the format saves them time, we expected that this time-saving strategy led to a concentration of ECG shopping for click and pickup customers in less retail formats than non-customers. But what the results show is that, apart from click and pickup, they shop in as many retail formats as non-customers, meaning that in the end, they use one more format than non-customers. Thus their ECG shopping is more fragmented. The traditional weekly supermarket shop is divided between the click and pickup outlet and other stores (including the supermarket) where certain purchases, such as fresh produce, are transferred. The following diagram (see Figure 2) shows this fragmentation of households' retail worlds. Even if the number of retail formats is the same (apart from click and pickup), frequencies and content of the shopping cart in those formats could be different between click and pickup customers and non-customers.

Figure 2 : The fragmentation of retail worlds among click and pickup users



Where F1, F2 and F3 stand for retail formats other than click and pickup outlets and super- or hypermarkets. And F1', F2' and F3' are the same retail formats as F1, F2 and F3 associated with different shopping practices.

This fragmentation is enabled by the use of click and pickup because, despite criticism of supermarkets and hypermarkets, they are still the most important supply channels (used by 95% of households), because they sell all kinds of products at affordable prices. Click and pickup outlets, precisely because they offer the same products, at the same prices and without the constraints (long time required for shopping, waiting at the checkouts, opening times, etc.), offer the possibility of an alternative to going to supermarkets and go hand in hand with a twofold fragmentation:

- The fragmentation of click and pickup shopping for ECGs: shopping using a click and pickup outlet consists of a succession of short stages which can be performed at different times and in different places.
- The fragmentation of ECG shopping: the, often weekly, shopping trip to a supermarket or hypermarket can be split between the click and pickup outlet and other stores. Some of the contents of the supermarket shopping cart are purchased either from the click and pickup outlet or from other sources, including supermarkets but maybe also retailers that are more specialised (a butcher's shop for meat, a market for vegetables) where they could go more often or buy more products.

ECG shopping becomes a succession of shorter stages, for which it may be easier to find time in household schedules. Fragmented ECG shopping provides greater flexibility than a long stop in a supermarket and would no longer necessarily be done on Saturdays. This means in terms of travel behaviour, that the weekly trip to the supermarket is fragmented into several trips to several shops. However, the trip frequency issue has not been resolved. If shopping is divided into several shorter stages, they could be more frequent and trip chaining could be easier. Thus, the division of shopping between several formats still raises issues with regard to time.

#### 4.3. *A relative influence on households' schedules*

Almost all click and pickup customers (94%) consider that the format saves them time. Unfortunately the survey does not allow us to measure the time savings (if any) they make, because there is no indication about the duration of ECG shopping. However an analysis of the times and days involved in purchasing practices should shed light on the temporal implications of using a click and pickup outlet.

As stated above, click and pickup breaks up the act of purchase into ordering and collection. The time taken to place the order cannot be determined from the survey. But with experience, ordering is likely to become fast, as users become familiar with the website, and make use of the opportunities to retrieve previous orders. Above all, time spent ordering is probably perceived as less costly than time spent in the supermarket because, on the one hand, order placement can be done from home, in a private space (Kaufmann, 2002). On the other hand, making the order can be superimposed on other activities (preparing the meal, watching television, etc.): multi-tasking of this type also modifies the perception of time (Jaureguiberry, 2003).

Regarding the collection of click and pickup orders, Table 6 shows that this tends to take place during the week, especially at the end of the day, unlike shopping in a physical store, where weekends - particularly Saturdays - are preferred. This is consistent with previous work that shows that the collection of shopping is often fitted into an existing trip, in particular the return home in the evening after work (Gasnier & Raveneau, 2016; Pernot & Aguiléra, 2017). Indeed, the profile of click and pickup users is characterised by several constraints on their schedules (working woman and distance from shops) and their use of a click and pickup outlet appears as an attempt to save time. Fitting the collection into an existing trip is a way of avoiding making a separate shopping trip. But not all click and pickup customers collect their order during the week: almost one-sixth of them still collect their orders on Saturdays. This means that even if Saturday is not the preferred day for the collection of click and pickup orders, it is still a "day like any other"<sup>9</sup>. All click and pickup customers do not transfer their

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<sup>9</sup> We consider that the shops are open six days a week (most are closed on Sundays).

weekend shopping to weekdays. Those who collect their order on Saturday are likely either to fit this into another existing trip or make a special round trip from home to the click and pickup outlet and back. In the latter case, households do not save a trip, but using a click and pickup outlet still means they avoid a long visit to the supermarket. Thus, the temporal optimisation of supply does not seem as certain or universal as the justifications given by customers might suggest. While click and pickup outlet use is an important part of the organisation of certain households, it also permits other forms of reorganisation that need to be characterised.

Table 5 : Timing of ECG shopping in click and pickup outlets and off line

	Weekdays		Weekend		Total	Weighted total
	Before 2pm	After 2pm	Before 2pm	After 2pm		
<b>Collection from click and pickup outlet</b>						
Households who use click and pickup outlets	33%	51%	12%	4%	100%	146.3
<b>Off-line shopping for ECGs</b>						
<i>(<math>\chi^2</math> Test: <math>\chi^2 = 21.117</math> ; degrees of freedom = 3; p-value = 9.957e-05)</i>						
Households who do not use click and pickup outlets	42%	37%	12%	10%	100%	422.9
Households who use click and pickup outlets	20%	48%	17%	14%	100%	141.5
All households	36%	40%	13%	11%	100%	564.4

Source: Liv'Mob Survey, 2016 (without the nonresponses)

Table 6 also shows the timing of ECG shopping that is not from a click and pickup outlet. While click and pickup customers prefer to collect the contents of the order on weekdays, especially in the evening, they organise shopping in other formats differently. Weekday evenings are still favoured, but what seems to be most striking is their greater use of stores at weekends. These timing differences are not unrelated to the customer profile we have identified for click and pickup outlet use. Age and occupational status in particular have an influence on when households go to stores. Older, retired, people go to stores more readily on weekday mornings than the younger working people who make up the majority of click and pickup users.

The fragmentation of shopping activities thus goes hand in hand with a fragmentation of their timing. The long Saturday slot reserved for the supermarket has been replaced by shorter activities split between gaps in the household's schedule. Shopping can be collected from a click and pickup outlet during a compulsory trip, for example. In-store shopping can still be done on Saturdays, but this will be shorter or less strenuous than doing the entire shop in a large retail outlet. In term of travel behaviour, this means that shopping trips will still occur on Saturdays. Even if most of click and pickup customers avoid Saturdays to collect their order, they still make trips to physical stores.

**5. Conclusion**

This paper aims at better understanding the implications of click and pickup use on travel behaviours. The approach consists in examining the spatial and temporal organisation of household shopping schedules in order to comprehend location, timing and frequency of shopping trips. Unfortunately, our study lacks from location data and thus focuses on the characteristics of click and pickup customers, the distribution of ECG shopping between stores and the timing of these shopping trips.

The results show that purchases in click and pickups are still limited to a particular profile. And even for those who use click and pickup outlets, this purchasing practice is often occasional.

But what is interesting is that the use of click and pickup outlets is complementary to the use of other stores. Their customers shop in as many formats as non-customers in addition to click and pickup outlets. They benefit from this new shopping opportunity by using it besides other retail formats. This means that click and pickup outlets go together with the fragmentation of ECG shopping activities, allowing households to choose the formats that best suit their complex schedules but also their exacting consumption demands.

The time savings perceived by click and pickup customers seems to be the result of this fragmentation. Indeed, fragmentation allows households to have greater control over the timing of their shopping activities, which can be fitted in better with their complex schedules. Thus these more fragmented shopping activities allow time to be used continuously: by fitting into the gaps in schedules, shopping is no longer a source of interruptions and wasted time. The activities involved in shopping follow one another without an interruption and the feeling of wasting time is reduced. Shopping becomes less of a chore. After all, click and pickup outlets are part of the individualisation of people' relationships with time (Coninck & Guillot, 2013) and offer a solution to household consumption demands by allowing shopping activities to be split between several formats and several times. Thus, the timing of shopping activities is more closely linked in with schedules, and better corresponds to today's configuration of time as defined by Ascher (1997).

Regarding travel behaviour, this diversification of retail worlds has impacts that we are seeking to describe. Using a greater number of retail formats should on the face of it lead to a multiplication of shopping trips. However, the frequency with which households make purchases in these formats and their location remain to be determined. Indeed, the click and pickup outlets could be located near users' homes or other places they go to, leading to shorter travel distances. The temporal fragmentation of shopping activities could result in more trip chaining: fitting ECG shopping into the gaps in schedules avoids the need for a specific round trip. In order to address these issues, more data are needed; for example diary studies, recording weekly/monthly activities of households (time, location, travel) could enable to measure total time spent shopping, shopping frequencies in each format, total travel distance and time, modes of transport, and make comparisons between click and pickup users and others.

In addition, different purchasing practices coexist, both in terms of the number of shop formats used and the timing of shopping activities, as witnessed by the fact that our results do not reveal any overwhelming trends. There are two main difficulties inherent in shopping: the need to coordinate schedules and the need to satisfy consumer expectations. The different purchasing practices associated with click and pickups illustrate the diversity of households' responses to these difficulties. This diversity is facilitated by the two-fold fragmentation which, by reducing spatio-temporal constraints, increases the available shopping options. Consequently, this diversity of practices may result in a diversity of travel behaviours which need to be explored. Semi-structured interviews with households using click and pickup outlets should shed light on the variety of shopping practices and travel behaviours.

Finally, this study suggests the hypothesis that ECG shopping time budget might be constant. Indeed, as mentioned in the introduction, the time budget allocated to shopping has been constant between 1974 and 2010, in spite of a decrease in shopping trips (Brousse et al., 2015). Today, on the one hand, click and pickup customers feel that they save time, and on the other hand they diversify their shopping practices in a greater number of stores. What is interesting is not really to measure whether or not they save time using click and pickup.

Actually, the fact that they feel saving time shows that using click and pickups enables them to be done with the supermarket chore. This feeling might in fact result in a deployment of purchasing practices between the entities in households' diversified retail worlds. This hypothesis can be seen as a parallel with Zahavi's conjecture (Zahavi & Talvitie, 1980) regarding the constant nature of travel time budgets: while an improvement in transport supply permits an increase in speed, the time saved is used to travel greater distances. This means that an "improvement" in the retail offering, such as click and pickup outlets, might be used by households to shop at a greater number of retail formats, which allows households to match their choice of retail outlet to their consumption requirements and complex schedules. Thus they might re-allocate the time that they think they save, to other shopping activities during which they go to the supermarket in order to buy fresh produce for example. They also may go more often to a butcher's shop that is a little far away but which sells good quality meat, or make an exceptional trip to the shopping centre just to wander around. Even if there is no time savings, there might be a change in the quality of shopping time spent. But in terms of travel behaviours, this hypothesis, combined with the effective diversification of retail worlds, would have multiplication of trips as a consequence.

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## Bibliography

- Adoue, F. (2016). *La mobilité connectée au quotidien. Les usages du smartphone dans les transports en commun franciliens*. Université Paris Est, France.
- Aguiléra, A., Guillot, C., & Rallet, A. (2012). Mobile ICTs and physical mobility: Review and research agenda. *Transportation Research Part A: Policy and Practice*, 46(4), 664-672.
- Anderson, W. P., Chatterjee, L., & Lakshmanan, T. r. (2003). E-commerce, Transportation, and Economic Geography. *Growth and Change*, 34(4), 415-432.
- Anquez, M.-C. (2004). Elles font les courses au pas de course. In J.-P. Bondue, *Temps des courses, course des temps : actes du Colloque international organisé à Lille et à Roubaix les 21 et 22 novembre 2003*. Lille, France: USTL.
- Ascher, F. (1997). Du vivre en juste à temps au chrono-urbanisme. *Les Annales de la Recherche Urbaine*, 77(1), 112-122.
- Barrère-Maurisson, M.-A. (2012). L'évolution des rôles masculin et féminin au sein de la famille. *Les Cahiers français: documents d'actualité*, (371), 22-29.
- Belton-Chevallier, L., Coninck, F. de, & Motte-Baumvol, B. (2016a). La durabilité du périurbain dépendant de l'automobile au regard des pratiques d'achat en ligne des ménages. *Géographie, économie, société*, 18(1), 141-165.
- Belton-Chevallier, L., & Motte-Baumvol, B. (2014). *Les effets de la vente en ligne sur les inégalités territoriales d'accès au commerce. Vers un nivellement des disparités urbain-périurbain*. Research Report, Université de Bourgogne.
- Belton-Chevallier, L., Motte-Baumvol, B., & Coninck, F. de. (2016b). La dimension spatiale de l'achat en ligne: Des pratiques spécifiques aux ménages périurbains ? *Netcom*, (30-1/2), 29-60.
- Bitoun, O. (2009). *E-commerce et distribution : comment Internet bouscule les canaux de vente* (Ascel). Paris.
- Bondue, J.-P. (2004). Introduction générale, Time is shopping. In J.-P. Bondue, *Temps des courses, course des temps : actes du Colloque international organisé à Lille et à Roubaix les 21 et 22 novembre 2003*. Lille, France: USTL.
- Brousse, C., Ferrante, A., & Turner, L. (2015). *Le temps des courses depuis 1974. De moins en moins fréquentes et toujours plus longues le samedi*. (INSEE Première No. 1533). INSEE.
- Cao, X. (Jason). (2012). The relationships between e-shopping and store shopping in the shopping process of search goods. *Transportation Research Part A: Policy and Practice*, 46(7), 993-1002.
- Choo, S., & Mokhtarian, P. L. (2007). Telecommunications and travel demand and supply: Aggregate structural equation models for the US. *Transportation Research Part A: Policy and Practice*, 41(1), 4-18.
- Cohen-Blankshtain, G., & Rotem-Mindali, O. (2016). Key research themes on ICT and sustainable urban mobility. *International Journal of Sustainable Transportation*, 10(1), 9- 17.
- Coninck, F. de, & Guillot, C. (2013). L'individualisation du rapport au temps, Marqueur d'une évolution sociale. *Revue interrogations*.



- Couclelis, H. (2003). Housing and the new geography of accessibility in the information age. *Open house international*, 28, 7-13.
- Couclelis, H. (2004). Pizza over the Internet: e-commerce, the fragmentation of activity and the tyranny of the region. *Entrepreneurship & Regional Development*, 16(1), 41-54.
- Crocco, F., Eboli, L., & Mazzulla, G. (2013). Individual Attitudes and Shopping Mode Characteristics Affecting the Use of E-Shopping and Related Travel. *Transport and Telecommunication*, 14(1).
- Croutte, P., Lautié, S., & Hoibian, S. (2017). *Baromètre du numérique 2017 (17ème édition)* (No. R337). CREDOC.
- Dembo, A., & Duchen, P. (2013). *Plus forte fréquentation des commerces de proximité, de surgelés et du hard-discount* (Consommation et modes de vie No. 263) (p. 4). CREDOC.
- Deprez, S., & Vidal, P. (2016). Drives des villes versus drives des champs : les nouveaux territoires du commerce alimentaire. In R.-P. Desse & S. Lestrade, *Mutations de l'espace marchand* (p. 29-44).
- Desjeux, D. (2006). *La consommation*. Paris, France: Presses universitaires de France.
- Ding, Y., & Lu, H. (2017). The interactions between online shopping and personal activity travel behavior: an analysis with a GPS-based activity travel diary. *Transportation*, 44(2), 311-324.
- Frag, S., Dijst, M., & Lanzendorf, M. (2003). Exploring the use of e-shopping and its impact on personal travel behavior in the Netherlands. *Transportation Research Record: Journal of the Transportation Research Board*, (1858), 47-54.
- Frag, S., Krizek, K. J., & Dijst, M. (2006a). E-Shopping and its Relationship with In-store Shopping: Empirical Evidence from the Netherlands and the USA. *Transport Reviews*, 26(1), 43-61.
- Frag, S., Schwanen, T., Dijst, M., & Faber, J. (2007). Shopping online and/or in-store? A structural equation model of the relationships between e-shopping and in-store shopping. *Transportation Research Part A: Policy and Practice*, 41(2), 125-141.
- Frag, S., Weltevreden, J., van Rietbergen, T., Dijst, M., & van Oort, F. (2006b). E-Shopping in the Netherlands: Does Geography Matter? *Environment and Planning B: Planning and Design*,
- Ferrell, C. (2004). Home-based teleshoppers and shopping travel: Do teleshoppers travel less? *Transportation Research Record: Journal of the Transportation Research Board*, (1894), 241-248.
- Ferrell, C. (2005). Home-based teleshopping and shopping travel: Where do people find the time? *Transportation Research Record: Journal of the Transportation Research Board*, (1926), 212-223.
- FEVAD. (2018). Les chiffres clés.
- Gallouj, C. (2004). Temps des ménages, temps des courses et changements institutionnels dans le grand commerce. In J.-P. Bondue, *Temps des courses, course des temps : actes du Colloque international organisé à Lille et à Roubaix les 21 et 22 novembre 2003* (p. 340). Lille, France: USTL.
- Gasnier, A., & Raveneau, A. (2016). Effets territoriaux de la connectivité des drives. In R.-P. Desse & S. Lestrade, *Mutations de l'espace marchand* (p. 45-58). Presses Universitaires de Rennes.

- Geuens, M., Brengman, M., & S'Jegers, R. (2003). Food retailing, now and in the future. A consumer perspective. *Journal of Retailing and Consumer Services*, 10(4), 241-251.
- Guel, F. L., Pénard, T., & Suire, R. (2005). Adoption et usage marchand de l'Internet : une étude économétrique sur données bretonnes. *Economie & prévision*, no 167(1), 67-84.
- Jaureguiberry. (2003). L'homme branché : mobile et pressé. In F. Ascher & F. Godard (Éd.), *Modernité : la nouvelle carte du temps*. L'AUBE/datar.
- Josse, J., & Husson, F. (2016). missMDA: A Package for Handling Missing Values in Multivariate Data Analysis. *Journal of Statistical Software*, 70(1).
- Julsrud, T. E., & Denstadli, J. M. (2017). Smartphones, travel time-use, and attitudes to public transport services. Insights from an explorative study of urban dwellers in two Norwegian cities. *International Journal of Sustainable Transportation*, 11(8), 602-610.
- Kaufmann, V. (2002). Temps et pratiques modales. Le plus court est-il le mieux ? The rationality of perception and modal choice. Is quickest best? *Recherche - Transports - Sécurité*, 75, 131-143
- Koyuncu, C., & Bhattacharya, G. (2004). The impacts of quickness, price, payment risk, and delivery issues on on-line shopping. *The Journal of Socio-Economics*, 33(2), 241-251.
- Lesnard, L., & de Saint Pol, T. (2008). Organisation du travail dans la semaine des individus et des couples actifs: le poids des déterminants économiques et sociaux. *Economie et statistique*, 414(1), 53-74.
- Lestrade, S. (2001). Les centres commerciaux : centres d'achat et centres de vie en région parisienne. *Bulletin de l'Association de géographes français*, 78(4), 339-349.
- Lipovetsky, G. (2006). *Le bonheur paradoxal: Essai sur la société d'hyperconsommation*. Paris: Gallimard.
- Marei, N., Aguiléra, A., Chevallier, L. B., Blanquart, C., & Seidel, S. (2016). Pratiques et lieux du e-commerce alimentaire : Nouvelles logistiques, nouvelles mobilités ? *Netcom*, (30-1/2), 119-138.
- Méda, D. (2008). *Le temps des femmes: pour un nouveau partage des rôles*. Paris, France: Flammarion, impr. 2008.
- Moati, P. (2001). *L'avenir de la grande distribution*. Paris, France: O. Jacob, DL 2001.
- Moati, P. (2013). *L'hypermarché : la crise de la cinquantaine* (p. 4). Paris: ObSoCo.
- Moati, P. (2016). Vers la fin de la grande distribution ?, Toward the end of large retailing ? *Revue Française de Socio-Économie*, n° 16(1), 99-118.
- Mokhtarian, Patricia L. (2002). Telecommunications and Travel: The Case for Complementarity. *Journal of Industrial Ecology*, 6(2), 43-57.
- Mokhtarian, Patricia L. (2004). A conceptual analysis of the transportation impacts of B2C e-commerce. *Transportation*, 31(3), 257-284.
- Mokhtarian, Patricia L. (1990). A typology of relationships between telecommunications and transportation. *Transportation Research Part A: General*, 24(3), 231-242.

- Mokhtarian, Patricia L. & Tal, Gil (2013). Impacts of ICT on Travel Behavior: A Tapestry of Relationships. In Rodrigue Jean-Paul, Shaw Jon and Notteboom Theo (eds.), *The Sage Handbook of Transport Studies*, London: Sage Publications, Chapter 14, 241-260.
- Mokhtarian, P. L. (2016). Discrete choice models' p2: A reintroduction to an old friend. *Journal of Choice Modelling*, 21, 60-65.
- Morganosky, M. A., & Cude, B. J. (2000). Consumer response to online grocery shopping. *International Journal of Retail & Distribution Management*, 28(1), 17-26.
- Nielsen. (2018, mai 24). Grande consommation & e-commerce : la France championne d'Europe avec 6.6% des achats réalisés online ! Consulté 6 juin 2019, à l'adresse <http://www.nielsen.com/fr/fr/insights/news/2018/grande-consommation-e-commerce-la-france-championne-europe>
- Nobis, C., & Lenz, B. (2009). Communication and mobility behaviour – a trend and panel analysis of the correlation between mobile phone use and mobility. *Journal of Transport Geography*, 17(2), 93- 103.
- Pernot, D., & Aguiléra, A. (2017). Les courses à l'heure d'internet. Lieux, temporalités et mobilités pour achats des clients des drives. *Netcom. Réseaux, communication et territoires*, (31-3/4), 463-488.
- Quételard, B. (2010). *Se rendre au travail ou faire ses courses motive toujours un déplacement quotidien sur deux. Le recours à la voiture se stabilise.* (La revue du CGDD) (p. 25). Rallet, A. (2001). Commerce électronique et localisation urbaine des activités commerciales. *Revue économique*, 52(7), 267-288.
- Ranvier, M., Sury, R., & Muller, A. (2009). La vente de produits alimentaires sur Internet: un état des lieux en 2009 (Cahier de recherche No 301).
- Ren, F., & Kwan, M.-P. (2009). The Impact of Geographic Context on E-Shopping Behavior. *Environment and Planning B: Planning and Design*, 36(2), 262-278.
- Ricroch, L. (2012). *En 25 ans, moins de tâches domestiques pour les femmes, l'écart de situation avec les hommes se réduit* (Regards sur la parité) (p. 66-80). INSEE.
- Robinson, H., Dall'Olmo Riley, F., Rettie, R., & Rolls-Willson, G. (2007). The role of situational variables in online grocery shopping in the UK. *The Marketing Review*, 7(1), 89-106.
- Salomon, I. (1986). Telecommunications and travel relationships: a review. *Transportation Research Part A: General*, 20(3), 223- 238.
- Schwanen, T., & Kwan, M.-P. (2008). The Internet, mobile phone and space-time constraints. *Geoforum*, 39(3), 1362-1377.
- Tavoularis, G., Hébel, P., Billmann, M., & Lelarge, C. (2016). *Les Français toujours très attachés à la qualité* (Consommation et modes de vie No. 283). CREDOC.
- Zahavi, Y., & Talvitie, A. (1980). Regularities in travel time and money expenditure. *Transportation Research Record*, 750, 13-19.