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# On the unexpected differences in media usage in purchasing in France and Flanders

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## ABSTRACT

*It is often (implicitly) assumed that e-commerce behavior is similar in countries with a similar culture. Through a study of e-commerce behavior of both, private consumers and company representatives, this paper proves there are actually significant differences in e-commerce behavior between subgroups of such countries. In this study, statistically significant differences are found in the stated appropriateness of different media to find product information, to find a supplier and to make the actual purchase.*

**Key-words:** E-commerce adoption, Culture, Website usage, Business-to-Consumer.

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## RÉSUMÉ

*Des similitudes sont généralement établies en matière de comportement à l'égard du e-commerce entre les pays ayant des cultures similaires. A travers une étude des comportements en matière de e-commerce, menée à la fois auprès de particuliers et de professionnels, cet article montre que des différences importantes existent entre de tels pays. Cette étude met en évidence des différences statistiquement significatives sur la question du canal le plus adapté pour trouver l'information sur un produit, pour trouver un fournisseur et pour accomplir un achat.*

**Mots-clés :** Adoption du e-commerce, Culture, Utilisation des sites de e-commerce, Business-to-Consumer.

## 1. INTRODUCTION

Many different purchasing process models have been presented in the past (Engel, Blackwell, Miniard, 1995; Anderson & Chambers, 1985; Hansen, 2005). For instance, Engel, Blackwell and Miniard (1995) discern five different steps in the Buyer's decision process: the identification of a need or a problem, the search for information, the evaluation of alternatives, the purchase decision and the post-purchase evaluation. Nowadays we can find internet based services that support all steps in the purchasing process. While some commercial websites are widening their service portfolio to support the entire process, others are specializing to excel in only one step. Amazon.com, for example, supports the entire process, while Kelkoo.com only supports part of it by presenting price comparisons and peer reviews of products and suppliers.

In this paper, we investigate customers' "e-commerce" behavior. By selecting three subtasks of the purchasing process presented above, we adopt the following working definition of e-commerce: "E-commerce is a process whereby the Internet is used as channel (1) to find information about a product or service, (2) to find a supplier, and (3) to actually buy the product"<sup>1</sup>.

The internet has become a major channel for commercial activities in all developed countries and, even if more slowly, also in developing countries.

Most of the research in this field aims at identifying features site visitors seem to appreciate. One conclusion from that research is that it is profitable for companies to tailor websites to national cultures and local tastes by adapting content, language, and style (Singh, Furrer, and Ostinelli, 2004; Singh & Boughton, 2002; Sinkovics, Yamin & Hossinger, 2007).

The Internet is essentially a global medium. It is, therefore, interesting for companies to know what the purchasing behavior is of potential customers in different countries. While culturally customizing websites and adding features may be evaluated positively by visitors, companies need to know whether and for what functional purpose (i.e., for what steps in the purchasing process) customers actually use websites. The justification of certain investments – e.g. websites being indexed in portals – depends on the expected online customer behavior with respect to websites. Doing business on the Internet is not boundary-less or culture-free (Lim *et al.*, 2004; Liu and Wei, 2003; McCoy *et al.*, 2005; Singh *et al.* 2006) and findings from one country are thus not necessarily transferable to other countries even if with similar culture. Several studies consider the role of culture in on-line purchasing behavior. Most of those studies focus on a single country, mostly the USA (Hoffman, Kalsbeek and Novak, 1996; Rodgers and Harris, 2003; Wells & Chen, 1999; Seock & Bailey, 2008). Other studies compare countries geographically and

<sup>1</sup> This definition is in line with the different stages in the buying process mentioned in the literature review in Section 2.1.

culturally very distant such as China and the USA or the USA and Finland (e.g. Pavlou & Chai, 2002; Lynch, Kent and Srinivasan, 2001; Singh *et al.* 2003; Singh *et al.* 2004; Singh *et al.*, 2006) in order to maximize chances of finding differences attributable to different national cultures. Awkwardly, a research area that has remained understudied is whether similar national cultures in different countries are reflected in a similar purchasing behavior.

It has to be considered that the easiest place for a company to sell abroad is generally represented by the neighboring countries. Above that, buying in neighboring countries is easy for customers and this phenomenon is amplified if prices differ considerably between neighboring countries. This is the case for Denmark and Sweden for consumer electronics, Switzerland and France for groceries, France and Belgium for baby care produces, etc. In these cases the customers can investigate products locally (e.g., physically in their local shop, or on a local website) but buy products on the Internet from companies in neighboring countries; countries which may be similar to theirs and which are reachable when problems with the product arise. This is certainly the case in Europe where few hours driving can take customers across multiple countries.

Building on extant literature, this paper investigates therefore an important and understudied aspect of e-commerce, namely whether the purchasing process varies in neighboring countries with similar cultures. The aim is to understand

whether small differences in Hofstede's dimensions are reflected in small differences in e-commerce behavior or whether significant differences in e-commerce behavior may show up anyway. Since there is a gap in extant research with respect to e-commerce differences in neighboring countries that are considered to have similar cultures, our research intends to fill this gap. Based on a survey of purchasing behaviors of 969 private consumers and company representatives located in northern France and Belgium on 50 products, this research proves that statistically significant differences exist in e-commerce behavior even between people from two neighboring countries which seem rather similar in terms of Hofstede's cultural dimensions.

This paper is organized as follows. In the next section, the extant literature on cultural issues in electronic commerce and our hypothesis are presented. Next, we present our survey and the results of the analysis. Finally, the findings are discussed and conclusions are drawn.

## **2. LITERATURE REVIEW AND GOALS**

This paper deals with the extent to which customers of neighboring countries behave differently in the different steps of the e-commerce process. To address this question, our literature review focuses on two axes. First, the use of different channels in different steps of the buying process is discussed. Second, we analyze the cultural dimension of e-commerce adoption.

## 2.1. Using different channels in different stages of the buying process

Previous studies investigate the different stages of the buying process in a multi-channel environment (constituted of physical and electronic marketplaces) and put forward cross-channel effects. Kaufman-Scarborough and Lindquist (2002) carried out an empirical study about "e-shopping in a Multiple Channel Environment". They explore the connections between Internet use and other non-store media options (television infomercials, TV advertising, television shopping channels and print catalogs). They develop a conceptual framework which distinguishes the browsing and purchasing steps in the buying process. Their results show that shoppers who browse and/or purchase on the Internet differ in their use of multi-channel options related to their "perceptions of convenience". According to Kaufman-Scarborough and Lindquist, two kinds of buyers exist: those who prefer to make their purchases in a traditional store rather than online; and those who browse various non-store media and have extended their browsing to the Internet and yet prefer to purchase offline.

According to Nicholson, Clarke & Blakemore (2002), online and offline channels are used by consumers as complements. The authors argue that five dimensions of situational influence affect the consumers' use of a particular channel: the physical setting (that is to say the environment of the channel), the social setting (the presence of others), the temporal perspective (time

constraints), the task definition (cognitive and motivational elements) and antecedent states (moods). The results of this study suggest that customers search online and purchase offline. Internet thus appears as the preferred means to find information and prepare the purchase, but physical stores remain the preferred channel to conclude the buying process. Burke (2002) adheres to this idea, showing that consumers prefer the Internet for information search.

In a recent study, Verhoef, Neslin, and Vroomen (2007) provide three explanations for the searching online/buying offline phenomenon. Comparing the Internet and traditional stores, the authors show that the former has a "search attribute advantage", while the latter has a "purchase attribute advantage". Moreover, the Internet suffers from a "channel lock-in", that is to say the ability to retain customers during the whole buying process. Last but not least, Verhoef *et al.* put forward some "cross-channel synergy" that explain the searching online/buying offline phenomenon.

In a similar vein, Belvaux (2006) analyses the purchase behavior of consumers situated in multi-channel environments. He first identifies the main factors explaining the choice made by consumers between electronic and physical purchases. Belvaux tries to understand the respective advantages of both channels and distinguishes the two steps in the buying process (the search for information and the purchase act). His results highlight different possible combinations between the Internet and traditional stores. First, a

consumer may be led to switch from one channel to another because of the impossibility to pursue the buying process on a first channel. Second, a consumer may choose to combine different channels and to take advantage of both channels. Third, in certain cases (important purchases for example), a consumer may decide to take time to choose a product and a channel, and then to “zigzag” between electronic and physical marketplaces.

Previous researches thus show that consumers usually combine different channels during their decision-making process (Burke, 2002; Nicholson, Clarke & Blakemore, 2002; Kaufman-Scarborough and Lindquist, 2002; Verhoef, Neslin, and Vroomen, 2007). Other studies confirm this idea and consider that customers generally integrate both physical and electronic marketplaces in their purchase behaviours (Varadarajan and Yadav, 2002).

## **2.2. The cultural dimension of e-commerce adoption**

In an increasingly global business environment it is necessary to research the cultural dimensions of e-commerce adoption. For example, in a recent study Limayem and Rowe (2006) compare the factors that may influence the intentions of customers from France and Hong Kong to buy online. The authors put forward common points and differences between the consumers' behavior, depending on their nationality. Innovativeness and enabling conditions appear as important factors of online purchase

intentions, both in France and in Hong Kong. However, while attitude towards online purchasing has an impact on French consumers, it doesn't have any effect on consumers from Hong Kong and contrarily social influence only has an impact on consumers from Hong Kong but not on French ones. Limayem and Rowe conclude by suggesting that culture is a powerful drive and that greater attention should be paid to cultural factors in studies comparing online shopping.

Cultural traits have also been used to justify the inhibiting factors of on-line shopping (Lederer *et al.*, 2000; Lin and Lu, 2000). Reasons not to shop on-line are worries about payment security, worries about privacy, absence of confidence in e-retailers, the need to physically examine the product, worries about not receiving the goods or receiving them late and/or in bad condition (Hui, 2001). These reasons explain the “buying offline” phenomenon identified by Verhoef, Neslin, and Vroomen (2007) and Belvaux (2006). Literature on adoption of e-commerce shows that trust issues are important inhibitors of e-commerce adoption (Hoffman *et al.*, 1999; van Slyke, Belanger & Comunale, 2004; Palmer, Bailey & Faraj, 2000; Pavlou, 2003).

Culture has been studied intensively in international business research. Researchers have different opinions on how culture can be measured. Hofstede (1980) and the GLOBE project (House *et al.*, 2004) can be considered to be the two ‘titans’ in this research domain (Leung, 2006). Interestingly, Hofstede (2006) showed there are big

correlations between the GLOBE measurements and the Hofstede values. Other major cross-cultural research projects carried out in the 1990s are the World Values Survey (Inglehart *et al.*, 2004), the Survey of Values (Schwartz and Bardi, 2001), and the Smith *et al.* (2002) study of event management. The predominant emphasis here has been upon characterizing cultures in terms of shared values (Smith, 2006). Researchers are still indecisive what the best framework is to analyze culture (see e.g. Leung, 2006). As stated in (Ng, 2007), 'to date, most cultural distance scores have been based on Hofstede'. For this reason, and as our research does not aim to verify the correctness of different culture research frameworks, we chiefly focus here on Hofstede's framework. This seems even more appropriate as Hofstede's theory has often been used in information system research to explain differences in attitude towards IT (Straub, 1994; Straub *et al.*, 1997; Gallivan and Srite, 2005; Karahanna *et al.*, 2005, Pavlou and Chai, 2002).

According to Hofstede (1980), culture is "the collective programming of the mind" (1980, p. 260) that make different members of the same group behave similarly. Hofstede (1980) defines four dimensions that categorize national cultures: Power Distance, Individualism/Collectivism, Masculinity and Uncertainty Avoidance. Similar values in these dimensions imply similar culture and therefore similar attitudes and behaviors in similar situations,

dissimilar values imply instead dissimilar behaviors.

Looking at neighbouring countries, one often gets the impression that cultural differences are limited. In this paper we investigate the case of two neighbouring countries: France and Belgium. Table 1 compares the values of Belgium and France on the Hofstede cultural dimensions<sup>2</sup>. This table shows Belgium and France are culturally very close to each other. In fact, the history of Belgium and France is intertwined. The Belgium soil was indeed the theatre of most Franco-Spanish and Franco-Austrian wars during the 17<sup>th</sup> and 18<sup>th</sup> centuries. Following the French Revolution, the Low Countries (including Belgium, the Netherlands and Luxembourg) were actually annexed by the French First Republic. With the dissolution of the First French Empire, Belgium got separated from France and became part of the 'United Kingdom of the Netherlands' in 1815. The 1830 Belgian Revolution then led to the establishment of an independent government and the birth of modern Belgium.

While Table 1 shows there are small cultural differences between Belgium and France, differences are much smaller than the ones that are normally looked for in studies of cultural differences. Pavlou and Chai (2002) for example compared 58 Chinese and 55 American customers to investigate the role of three of Hofstede's cultural dimensions on e-commerce adoption in

<sup>2</sup> Values from the GLOBE project are only available for France, not for Belgium, on [http://www.thunderbird.edu/wwwfiles/ms/globe/Links/LQ\\_tables.pdf](http://www.thunderbird.edu/wwwfiles/ms/globe/Links/LQ_tables.pdf). The GLOBE-project could thus not be used to compare French and Belgian culture in this paper.

China and the USA. These two countries differ to a big extent on the three researched dimensions. (1) The Individualism/Collectivism is 20 for China, while it is 91 for the USA. (2) The Long-Term Orientation for China is 118, while it is 29 for the USA. (3) The Power Distance Index for China is 80, while it is 40 for the USA. In a similar vein, Bartikowski, Fassot and Singh (2006) carried out an empirical research to measure the acceptance by consumers of the websites of American and Japanese companies. The differences on the Hofstede dimensions are clearly much smaller between Belgium and France. Given the big range of values on the different dimensions for different countries worldwide, the differences between Belgium and France seem minor. Table 1 also includes, as an illustration, some values from Smith *et al.* (1996) and Inglehart (1998), which used more recent data than Hofstede. Given the range of values on their dimensions, these researchers also qualify Belgium and France as very similar. Similarly, Schwartz (1994) places Belgium and France culturally close to each other. In fact, cultural researchers often create groupings of culturally similar

countries. In Hofstede's classification, France and Belgium *both* appear in "Cluster 2".

In short, we can say that research has attributed differences in e-commerce behavior to big differences in cultural dimensions but has neglected largely to study what happens in case countries do not show big differences in cultural dimensions.

Some studies implicitly assume that the consumers in those countries behave similarly. Lynch, Kent and Srinivasan (2001) for example conducted an experiment with respect to the shopping behavior of 299 respondents in 12 countries. The respondents were divided in three regions: "North America", "Latin America" and "Western Europe". Their research seems to indicate that site quality, trust, and positive affect are useful to explain the purchase intentions and loyalty of visitors to the site and that the impact of these factors varies across different *regions* of the world and across different product categories. However, there were only few respondents from each 'region'. For example, there were in total only 104 respondents from Western Europe

	Hofstede's Power Distance Index	Hofstede's Individualism	Hofstede's Masculinity	Hofstede's Uncertainty Avoidance index	Smith's Egalitarian Commitment	Smith's Utilitarian Commitment	Inglehart's Post-Materialist values
France	68	71	43	86	111	-9	27
Belgium	65	75	54	94	84	12	27

**Table 1: A cultural comparison of France and Belgium using Hofstede's, Trompenaars' and Inglehart's data. (<http://www.geert-hofstede.com>)<sup>3</sup>.**

<sup>3</sup> Data for the Long-Term Orientation dimension is currently not yet available for Belgium and France. That dimension, however, focuses on Asian value systems, which are not the primary interest of the study at hand.



(which comprises at least ten countries). Such a figure can only be representative for a region if that region is homogeneous<sup>4</sup>.

In this paper, we test the assumption that has been made implicitly by many researchers:

*Hypothesis: There are no differences in e-commerce behavior for comparable consumer groups living in culturally similar, neighboring countries.*

E-commerce behavior then concerns (1) finding information about a product or service, (2) finding a supplier, and (3) actually buying the product. Contrary to the literature presented above, the main goal of this paper is thus to investigate whether significant differences exist in the three steps of e-commerce behavior amongst similar groups in neighboring countries that are culturally similar. Traditional thinking would indicate that we should find similarities. This thinking should be tested. In order to control for differences in age, gender, social strata and occupation we test our hypothesis on similar groups in the two countries.

### **3. RESEARCH METHODOLOGY**

As with every survey it is advisable to consider a large number of individuals in both countries that are studied.

Hence, for our research we set up a large survey. Our aim was to get not only quantitative input from the surveys but also some qualitative input because such data would allow us to give a better interpretation to the statistical test results. As e-commerce behavior of people evolves, the survey had to be conducted in France and Belgium in a limited span of time.

#### **3.1. Survey setup**

The survey was conducted at the end of 2007. Business students in France and Belgium attending their 3<sup>rd</sup> year of bachelor were explained the role of the Internet in doing business and were introduced to the survey. As a task, students had to interview a number of other people, both private individuals ('private persons') and professional purchasers ('company representatives'). In order to motivate the students to collect the data rigorously, and to get more qualitative feedback (and of course to have them learn about the issue), they got the additional task to write a report, formulating their findings on the basis of the data they collected. Having the survey done by a big amount of interviewers (the students) was considered to be a good way to collect a large amount of data in a limited time.

<sup>4</sup> Please note that gender and age distribution of the respondents in that paper is unclear. Furthermore, only two products were investigated in that research: T-shirts and CD-players. Contrary to the research of Lynch, Kent and Srinivasan (2001), many more than two products are considered in our research. Riegner (2007) did investigate a big number of products. However, consumers were asked to identify a product they had purchased in the last three months, either online or offline. This way, the set of products the customer thinks about, is – of course – not controlled by the researcher, and no legitimate conclusions could be made with respect to an 'average' product. Moreover, given the fact that this was a study about Internet behavior, the product the customer chose may distort the research results.

The survey was conducted in two neighboring countries – France and Belgium – by Northern France Economics students and by Belgian Economics students. The Belgian students actually all live in Flanders. ‘Flanders’ is the northern part of Belgium where Dutch is spoken<sup>5</sup>. It should be noted that while this survey did not sample the entire population of the two countries, it involved similar people (students and their networks) in both countries. The data we gathered should, therefore, not be considered as absolute figures of general validity for France or Belgium regarding people’s approach to e-commerce in the two countries. Rather, and in line with our research question, we test the existence of differences among similar demographic groups involved in the same process.

Each student was asked to fill in a questionnaire related to the three steps in the e-commerce behavior: 1. information gathering; 2. supplier selection; and 3. purchasing for different products. Two questionnaires were used, group 1 and group 2, covering 25 products each (50 in total). A list of the products is shown in Appendix A. Twenty products that seemed particularly appropriate for Internet purchasing (such as books, airplane seats, etc.) were chosen consciously from the yellow pages directory. To this, 30 products were added that were chosen randomly from the yellow pages directory. The French

and the Flemish online version of the yellow pages were used to determine the category-names for the French and the Belgian survey. If the same product or service was not found in both, the Van Dale dictionary was used for translation. The correct meaning of the terms in the survey was checked with native French and Dutch-speaking colleagues.

Given the fact that products were also chosen randomly, there are several products in the survey that may seem irrelevant to consumers on first sight. The products would typically be considered *indirect* products by company purchasers. These products were deliberately kept in the survey, as this is exactly a survey on how consumers find information on products, find possible suppliers, etc. The respondents were asked to give their opinion – related to each of the 25 products – on how they bought the product before, or on how they would buy it in the future if they had not bought it before. No distinction was made in the research between an actual purchase and the intention to make a buy, following the reasoning of Jackson *et al.* (1997).

For each product, the respondent was asked about his/her opinion on the appropriateness of different media to support different tasks in the purchasing process (see Appendix B). More specifically, for each product, the respondent had to give a value of 1 to

<sup>5</sup> The geographical territory called “Flanders” has varied over the course of history. The term “Flanders” is generally used to designate a geographical region crossing parts of Belgium, France, and the Netherlands. Nowadays, the term is mainly used to denote the northern part of Belgium with the status of autonomous region. Consequently, in this paper, the term “Flanders” refers to the autonomous Dutch-speaking northern region of Belgium.

4 to reveal his opinion about the information medium that could be used to achieve a task (e.g., to find a supplier). The value '1' was used to denote that a medium was considered 'very appropriate'; the value '2' indicated 'appropriate, but less important', the value '3' was used to denote that a medium was 'somewhat appropriate' and the value '4' indicated that a medium was considered 'not appropriate at all'. By using this legend and a limited number of values, it was tried to overcome – to the extent that this is possible in any study of culture – the fact that scale use can systematically differ between individuals of different countries (Ji *et al.*, 2000; Peng *et al.*, 1997).

### 3.2. Sample characteristics

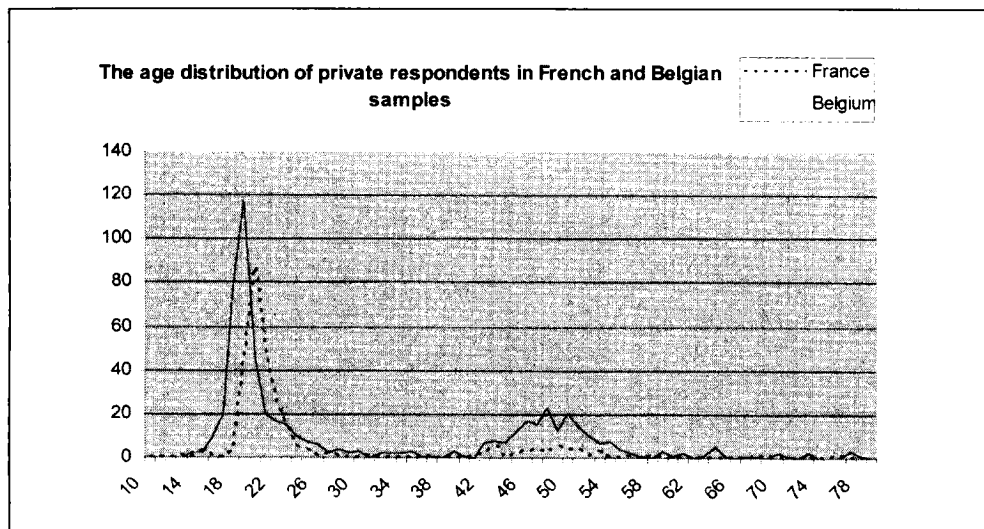
863 private respondents returned the questionnaire. The age distribution of the respondents is shown in Figure 1. This picture clearly illustrates that the data is not representative for the entire French and Belgian population. Two age groups are well represented and were selected for further investigation: people aged 18-25 (inclusive) and people aged 42-54 (inclusive). Of the 863 respondents, 774 fell in those age categories: 573 in the category 18-25 and 201 in the category 42-54. Of the people aged 18-25 it should be noted that 90% had a University degree or were pursuing a University degree). After cleaning the data (for example by omitting records where people entered wrong values, such as '0'), 762 records were retained. Of these, 62% were filled out by students.

Using students for a study often raises concerns of generalization of the results. However, this is nowadays an accepted practice (Slyke *et al.*, 2004; Chin & Gopal, 1995; Davis, 1989; Taylor & Todd, 1995). This concern is valid if the students are asked about a task that is not of direct relevance to them. However, the negative effects of the use of students are mitigated if the research domain is of relevance to the subjects (Gopal *et al.*, 1992-1993). For our research students (and others) were surveyed about a topic that is directly relevant to them and it is thus reasonable to expect the findings to be valid (Slyke *et al.*, 2004).

The survey was also filled out by 131 Belgian (Flemish) and 103 French company representatives. After cleaning the data, 125 Belgian (90 male, 35 female) and 97 French (66 male, 31 female) questionnaires were retained. Fifteen of the Belgian company questionnaires were dropped to get an equal distribution of genders in the French and the Belgian sample. The average age was 43 in the Belgian sample and 45 in the French sample.

In total, 969 questionnaires were thus used in the statistical tests. To be able to respond to the research question, the total sample was split in ten response groups. These were formed as follows:

- Private persons and company representatives.
- French and Belgian citizens.
- For the private persons: distinguishing between 'young' and 'senior' people (respectively age 18-25 inclusive and 42-54 inclusive).



**Figure 1: Age distribution of private respondents.**

- For the private persons: distinguishing males from females (because prior research suggests differences between the two genders in IT use (Gefen and Straub, 1997).

The distribution of the respondents over different response group is shown in Table 2.

### 3.3. Pre-analysis data preparation

Similar percentages of respondents in the French and the Belgian sample

filled out the survey considering product group 1 and product group 2. 53% of the Belgian sample concerned group 1 and 47% concerned group 2. For the French sample the figures were 52% and 48% respectively. Furthermore, the similarity of responses on product group 1 and product group 2 was tested for specific response groups with the Mann-Whitney test and the Kolmogorov-Smirnov test. Differences were only rarely statistically significant. Therefore, it was justifiable to group the responses of similar

Nationality	Gender	Private company	Age	Nr of respondents (Total 969)
French	Male	Private	18-25	166
French	Male	Private	42-54	14
French	Female	Private	18-25	87
French	Female	Private	42-54	24
French	Both	Company	/	97
Belgian	Male	Private	18-25	180
Belgian	Male	Private	42-54	72
Belgian	Female	Private	18-25	131
Belgian	Female	Private	42-54	88
Belgian	Both	Company	/	110

**Table 2: Number of respondents per response group**

respondents (in terms of company representative or private consumer, gender, country and age) for both product groups. Given the fact that some response groups had only a low number of respondents, aggregating group 1 and group 2 data was important.

To enable a presentation of the results, the answers of respondents with respect to a number of options on different questions were grouped as shown in the right column of Appendix B. For example, the survey asked about the appropriateness of "Google" and "other search engines (such as Yahoo, MSN, etc.)" to find a supplier. The research results show that the market share of Google is overwhelming in both countries and that 90% of people who do use another search engine also use Google. Hence, the two options were grouped in one aggregated option to find a supplier: 'Using an Internet Search Engine'. Grouping happened on the basis of keeping the lowest score that was given on the different options. That is, if '1' was answered for at least one of the options, this aggregated option got the value '1'. If '2' was the lowest figure over all options, this aggregated option got the value '2'; and so on. Please note that for each question the option 'other' was included. This option was, however, hardly selected by any of the respondents (reflecting the fact that the suggested options were sufficient) and is not reported further in the research results.

Furthermore, as this research paper investigates differences among countries, rather than differences

among different products, the responses of a respondent on different products were grouped to one average (per response option) for the respondent. In this way the percentages of 1's, 2's, 3's and 4's on each option was determined for each respondent. The tests were run on this aggregated data, focusing only on the percentages of 1's and 4's to enable a clear presentation.

### 3.4. Data analysis

The normality of the distribution of responses from different customers in a response group was tested with the Shapiro-Wilk test. The hypothesis of a normal distribution could not be accepted for the responses on the questions (i.e.,  $p > 0.05$ ), except in a few cases. Applying a logarithmic or a square-root transformation did not return normally distributed data either. Consequently, non-parametric statistical tests were used. The Mann-Whitney test was used to compare responses from different response groups (following Kerr *et al.*, 2002) using the 'exact' method. If calculating this was impossible, the asymptotic method was used, denoted by "(A)" next to the significance level in the tables that follow. This only happened in cases of big sample sizes and is thus justifiable. When comparing different media for one response group, the Wilcoxon paired test was used (following Kerr *et al.*, 2002).

Non-parametric tests unfortunately have a limited statistical power in that they are less likely to detect an effect in the data than parametric tests (which however cannot be used with our data

set). However, several statistically significant differences were found between French and Belgian response groups. To improve the power especially in cases of small sample size response groups, not only the Mann-Whitney test was performed, but also the Kolmogorov-Smirnov Z-test. If the Mann-Whitney test returned a significance level between 0.05 and 0.10, and the exact Kolmogorov-Smirnov Z-test returned a significance level below 0.05, statistical significance was concluded. Such exceptions are mentioned explicitly in the text and tables. All statistical tests were performed using SPSS 15.0.

#### **4. RESULTS**

The results are presented in accordance to the working definition of e-commerce presented in the introduction. First we present survey results concerning the different options to find product information. Next, in Section 4.2, the findings concerning the different options for searching suppliers are discussed. Finally, in Section 4.3, the different options for buying are evaluated.

##### **4.1. Different ways to find product information**

In Table 3, the average responses of the response groups on the appropriateness of different media to gather product (or service) information

are presented. In this table, similar respondents (in terms of age, gender, and private or company) from different countries are compared. 'Country means' are weighted averages, with a weight of 20% for each of the five response groups (per country). The p-values of the Mann-Whitney test to compare Belgian and French response groups are also included. Significant values ( $p < 0.05$ ) are shown in bold. In Appendix C, detailed results are shown of the Mann-Whitney-test. These tables show that:

- On average about 27% of responses say that "Friends and Family" are very appropriate to gather product information and 35% say that they are not appropriate at all. Per response group, responses are the same for French and Belgian responses.
- On average 26% of Belgian responses say that "Communication with the seller" is very appropriate whereas 39% of French responses say so. Statistically significant (small to medium) differences ( $p < 0.05$ ) between Belgian and French responses show up in every response group<sup>6</sup>, except in the group of the senior female respondents ( $p = 0.0508$ ). 45% of Belgian responses say that "Communication with the seller" is not appropriate at all whereas only 36% of French responses say this. The difference with respect to being 'not appropriate at all' is statistically significant for the young response groups, as well as for

<sup>6</sup> There are also big differences between different user groups. There are two eye-catching outliers: of the senior Belgian private male responses only 21% indicate that Communication with the seller is very appropriate. On the other hand, 45% of 'Young' French private female responses say that Communication with the seller is very appropriate.

the senior female respondents (with the Kolmogorov-Smirnov test:  $z=1.2336$ ;  $p=0.0495$ ) and the company representatives ( $p<0.05$ ).

- On average 42% of Belgian responses and 40% of French responses say that websites are very appropriate to find information about products or services. 26% of Belgian responses and 32% of French responses say that websites are not appropriate at all to gather product information. The difference between Belgian and French responses is not statistically significant for any of the response groups.

Related to the question whether websites are appropriate to find

product information, the respondents were asked how much product information the chosen supplier had on his website. The results of the comparison between Belgium and France are shown in Table 4 (detailed test results are shown in Appendix D).

Although Table 3 does not show statistically significant differences between the two countries in the stated appropriateness to look for product or service information online, Table 4 does show differences. There are small, but statistically significant differences between Belgian and French youngsters and also between company representatives of the two countries. For example, on average 35% of

		Friends & Family = 1	Friends & Family = 4	Commun. Sel. = 1	Commun. Sel. = 4	Internet = 1	Internet = 4
Young Females	Mean Belgium	0.3133	0.2809	0.2846	0.3945	0.4892	0.1994
	Mean France	0.2981	0.3011	0.4506	0.2864	0.4354	0.2409
	Exact Sig. (2-tailed)	0.7187	0.3435	<b>0.0000</b>	<b>0.0046</b>	0.1591	0.1082
Young Males	Mean Belgium	0.2356	0.3488	0.2687	0.4136	0.4607	0.2093
	Mean France	0.24482	0.3463	0.3788	0.3198	0.4374	0.2419
	Exact Sig. (2-tailed)	0.4205 (A)	0.9030 (A)	<b>0.0000 (A)</b>	<b>0.0034 (A)</b>	0.5095 (A)	0.1389 (A)
Senior Females	Mean Belgium	0.2964	0.3418	0.2545	0.5055	0.3509	0.3382
	Mean France	0.28	0.3617	0.3400	0.3933	0.3583	0.3683
	Exact Sig. (2-tailed)	0.9058	0.5238	0.0508	<b>0.0749 (B)</b>	0.7175	0.7682
Senior Males	Mean Belgium	0.2433	0.3528	0.2056	0.4983	0.3883	0.2650
	Mean France	0.3314	0.3286	0.3686	0.4486	0.36	0.3914
	Exact Sig. (2-tailed)	0.1511	0.9054	<b>0.0255</b>	0.5998	0.7521	0.0735
Company representatives	Mean Belgium	0.2335	0.4058	0.2869	0.4458	0.4106	0.2818
	Mean France	0.2297	0.4351	0.3909	0.3538	0.3856	0.3369
	Exact Sig. (2-tailed)	0.5483	0.8321	<b>0.0007</b>	<b>0.0066</b>	0.5338	0.4731
Overall Mean Belgium		0.2644	0.3460	0.2601	0.4515	0.4199	0.2587
Overall Mean France		0.2764	0.3546	0.3858	0.3804	0.3853	0.3159

**Table 3: Average scores of different media to find product and service information. '1'-column: response = "medium is very appropriate"; '4'-column: response = "medium is not appropriate at all". Overall mean = unweighted mean of different response groups. P-values for comparison across countries calculated with the Mann-Whitney test. (A) denotes the result of the asymptotic method instead of the exact method. (B) denotes a difference that was concluded to be significant with the Kolmogorov-Smirnov Z-test.**

		No info online	Some info online	Much info online	Don't remember	Did not check.
Young Females	Mean Belgium	0,08	0,15	0,31	0,05	0,41
	Mean France	0,12	0,19	0,29	0,06	0,34
	Exact Sig. (2-tailed)	<b>0,0006</b>	<b>0,0358</b>	0,3522	0,9388	0,099
Young Males	Mean Belgium	0,13	0,15	<b>0,29</b>	0,05	0,38
	Mean France	0,14	0,19	0,27	0,07	0,33
	Exact Sig. (2-tailed)	<b>0,0014</b>	<b>0,0229 (A)</b>	0,4483	0,5763	0,1423 (A)
Senior Females	Mean Belgium	0,15	0,15	0,23	0,07	0,39
	Mean France	0,22	0,15	0,22	0,05	0,36
	Exact Sig. (2-tailed)	0,1115	0,4876	0,4899	0,874	0,7197
Senior Males	Mean Belgium	0,12	0,18	<b>0,28</b>	0,06	0,38
	Mean France	0,11	0,13	<b>0,28</b>	0,07	0,42
	Exact Sig. (2-tailed)	<b>0,7598</b>	<b>0,5947</b>	<b>0,988</b>	0,1996	0,5268
Company representatives	Mean Belgium	0,12	0,19	0,35	0,05	0,29
	Mean France	0,19	0,18	0,27	0,05	0,30
	Exact Sig. (2-tailed)	0,0621	0,7940	<b>0,0058</b>	0,7135	0,6484

**Table 4: Percentage of responses that say the chosen seller has no/some/much information online. P-values for comparison across countries calculated with the Mann-Whitney test. (A) denotes the result of the asymptotic method instead of the exact method.**

Belgian company representative responses say the chosen seller had much product information online, whereas this is only 27% for French responses.

By performing a Wilcoxon test for paired samples, the stated appropriateness of 'Communication with the seller' was compared to the stated appropriateness of 'the Internet' to find product or service information. Results are shown in Table 5.

For all Belgian response groups, there is a statistically significant difference ( $p < 0.005$ ). That is, all Belgian response groups (thus also the senior ones) find the Internet more appropriate to find product information than Communication with the seller. This difference is only moderate (0.3) for the senior female Belgians, but large (0.5) for the other response groups.

Differences between French response groups are not statistically significant, except for one response group ( $p < 0.05$ ) where a small difference is noted: young French males also say that communication with the seller is less appropriate than the Internet to get product information.

This suggests that Belgian respondents find websites more appropriate to find product and service information than communication with the seller, whereas French respondents do not.

#### **4.2. Different ways to find suppliers**

Different media can be used to find a supplier of a product or service. Table 6 shows the difference in responses among similar response groups (in



Belgian Young Female	Z	-5.5904	Median Seller Communication:	0.24
	Estimated difference size	0.4884	Median Internet:	0.44
	Asymp. Sig. (2-tailed)	0.0000 (a)		
Belgian Young Male	Z	-6.0888	Median Seller Communication:	0.24
	Estimated difference size	0.4538	Median Internet:	0.4
	Asymp. Sig. (2-tailed)	0.0000 (a)		
Belgian Senior Female	Z	-2.8218	Median Seller Communication:	0.18
	Estimated difference size	0.3008	Median Internet:	0.32
	Asymp. Sig. (2-tailed)	0.0048 (a)		
Belgian Senior Male	Z	-4.2189	Median Seller Communication:	0.16
	Estimated difference size	0.4972	Median Internet:	0.36
	Asymp. Sig. (2-tailed)	0.0000 (a)		
French Young Female	Z	-0.1481	Median Seller Communication:	0.44
	Estimated difference size	0.0157	Median Internet:	0.4
	Asymp. Sig. (2-tailed)	0.8838 (b)		
French Young Male	Z	-1.9943	Median Seller Communication:	0.32
	Estimated difference size	0.1548	Median Internet:	0.38
	Asymp. Sig. (2-tailed)	0.0481 (a)		
French Senior Female	Z	-0.0813	Median Seller Communication:	0.28
	Estimated difference size	0.0186	Median Internet:	0.32
	Asymp. Sig. (2-tailed)	0.9352 (a)		
French Senior Male	Z	-0.3147	Median Seller Communication:	0.36
	Estimated difference size	0.0841	Median Internet:	0.3
	Asymp. Sig. (2-tailed)	0.7530 (a)		

**Table 5: Wilcoxon-test to compare responses for 'very appropriate' for 'Communication with seller' and 'Internet' to find product information for a specific response group. (a=based on negative ranks; b=based on positive ranks).**

terms of age, gender, and private or company) from different countries with respect to the appropriateness of different media to find a supplier. Appendix E shows the detailed results of the Mann-Whitney tests. From these tables, we can say that,

- On average about 26% of both, Belgian and French responses say that "Friends and Family" are very appropriate to find a supplier. On average 34% of Belgian response and 39% of French responses indicate that Friends and Family are not appropriate at all.

Responses of most French and Belgian private respondents are not statistically significantly different when considering the 'very

appropriate' answers. However, when considering the 'not appropriate at all' answers, half of the private response groups show a statistically significant difference. Specifically, on average 50% of the French senior male responses find Friends and Family not appropriate at all, whereas only 36% of the Belgian senior male responses do not find Friends and Family appropriate to find a supplier. Statistically significant differences ( $p < 0.05$ ) in this direction are also found for young females (through the Kolmogorov-Smirnov Z-test,  $z = 1.456$ ,  $p = 0.0129$ ). The estimated difference sizes are small.

- In general, the Yellow Pages are considered a more appropriate

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	Friends & Family = 1	Friends & Family = 4	Yellow Pages Offline = 1	Yellow Pages Offline = 4	Yellow Pages Online = 1	Yellow Pages Online = 4	Internet search = 1	Internet search = 4	Other site = 1	Other site = 4	Fixed Supplier = 1	Fixed Supplier = 4
Young Females	Mean Belgium	0.3221382	0.1465656	0.6036641	0.1520618	0.5691603	0.3957252	0.2650456	0.0280924	0.8720611	0.0964893	0.7963282
	Mean France	0.3121724	0.2216092	0.5291954	0.2671264	0.4479161	0.3632299	0.3236782	0.0690471	0.8409195	0.1204609	0.7641264
	Exact Sig. (2-tailed)	0.9506	<b>0.0525 (B)</b>	<b>0.0016 (A, B)</b>	<b>0.0000</b>	<b>0.0149</b>	<b>0.0865</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0066</b>	<b>0.0946</b>	<b>0.3241 (A)</b>
Young Males	Mean Belgium	0.2522228	0.3508889	0.1131117	0.1095556	0.6848667	0.4257778	0.2611111	0.0415561	0.8675556	0.0835561	0.8213278
	Mean France	0.2566265	0.3643373	0.2053012	0.246747	0.4958627	0.3920482	0.2968675	0.0698795	0.8272289	0.1033741	0.7978313
	Exact Sig. (2-tailed)	0.6902 (A)	0.5201 (A)	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000 (A)</b>	<b>0.3799 (A)</b>	<b>0.3346 (A)</b>	<b>0.0000</b>	<b>0.0001 (A)</b>	<b>0.1705</b>	<b>0.4769 (A)</b>
Senior Females	Mean Belgium	0.2690909	0.3681818	0.2122727	0.1245455	0.6881818	0.2822614	0.4250011	0.019092	0.9631705	0.1154557	0.7668068
	Mean France	0.288375	0.3666667	0.193375	0.185	0.553375	0.2782917	0.4566708	0.0650042	0.8582917	0.1716667	0.708375
	Exact Sig. (2-tailed)	0.4649	0.9031	0.3217	<b>0.0056</b>	<b>0.0283</b>	<b>0.6089</b>	<b>0.5828</b>	<b>0.0196</b>	<b>0.0001</b>	<b>0.2087</b>	<b>0.4243</b>
Senior Males	Mean Belgium	0.2211111	0.3550139	0.1738903	0.1433333	0.5811111	0.3422083	0.3277792	0.0150014	0.9311111	0.1111111	0.775
	Mean France	0.2657143	0.5	0.2371429	0.6085714	0.6628571	0.2285786	0.6857857	0.0314357	0.9342143	0.1885714	0.78
	Exact Sig. (2-tailed)	0.2818	<b>0.0471</b>	<b>0.0578 (B)</b>	<b>0.0196</b>	<b>0.0508</b>	<b>0.3085</b>	<b>0.0001</b>	<b>0.0079</b>	<b>0.1026</b>	<b>0.2074</b>	<b>0.8321</b>
Company representatives	Mean Belgium	0.249455	0.364364	0.120373	0.147273	0.573818	0.353455	0.348384	0.017464	0.895273	0.193827	0.661818
	Mean France	0.251959	0.41733	0.207433	0.257742	0.516701	0.314237	0.42599	0.069279	0.832175	0.202072	0.660216
	Exact Sig. (2-tailed)	0.4657	0.2188	<b>0.0023</b>	<b>0.0003</b>	<b>0.1628 (A)</b>	<b>0.5321</b>	<b>0.1023</b>	<b>0.0002</b>	<b>0.0002</b>	<b>0.1909</b>	<b>0.8877</b>
Overall Mean Belgium	0.2628	0.3430	0.1532	0.1364	0.6194	0.3599	0.3265	0.0242	0.9038	0.1201	0.7643	
Overall Mean France	0.2750	0.3940	0.2130	0.2313	0.5353	0.3153	0.4376	0.0607	0.8586	0.1572	0.7421	

Table 6: Average scores of different media to find a supplier. P-values for comparison across countries calculated with the Mann-Whitney test. (A) denotes the result of the asymptotic method instead of the exact method. (B) denotes a difference that was concluded to be significant with the Kolmogorov-Smirnov Z-test. Overall mean = unweighted mean of different response groups.

medium to find a supplier in France than in Belgium. This is true for both, the offline and the online version of the Yellow Pages.

Only 15% of Belgian responses show that the *Offline version* of the Yellow Pages is very appropriate to find a supplier, whereas 60% say it is not appropriate at all. More than 21% of French responses indicate that the Offline version of the Yellow Pages is very appropriate, whereas 54% say that it is not appropriate at all. Statistically significant differences ( $p < 0.05$ ) between Belgium and France are found for all response groups except for the senior females<sup>7</sup>. Differences are small to moderate.

When considering the *online version* of the Yellow Pages, the difference between Belgian and French responses is statistically significant for all response groups ( $p < 0.05$ ). On average 23% of French responses indicate that the online version of the Yellow Pages is very appropriate, whereas this is only 14% for Belgian responses. Similarly, 62% of Belgian responses state that the online version of the Yellow Pages is not appropriate at all, whereas this is only 53% of French responses. Considering the 'very appropriate' answers, estimated difference sizes among countries are somewhat bigger among youngsters than among senior people.

- While the *online* version of the Yellow Pages is considered more appropriate in France than in Belgium, Internet search engines are

not considered more appropriate in France than in Belgium to find a supplier. In fact, 44% of French responses say that Internet search engines are not appropriate at all to find a supplier, whereas this is only 33% with Belgian responses. Breaking down the sample in different response groups only results in a moderate, statistical significant difference ( $p < 0.005$ ) for the senior male respondents.

- When considering other websites (such as electronic marketplaces) than Internet search engines and the Yellow Pages online, about 90% of Belgian responses and 86% of French responses indicate that 'other websites' are not appropriate at all.

On average 2% of Belgian responses and 6% of French responses show that other websites are very appropriate. Differences between French and Belgian responses are statistically significant ( $p < 0.05$ ) for all response groups and are generally moderately sized. French respondents are thus more likely than Belgian respondents to turn to websites such as e-bay for example to find a supplier of a product. This is also true for company representatives.

- Finally, when considering the appropriateness of having a fixed supplier for some product, differences between French and Belgian responses were all statistically insignificant.

From this we can say that, in general, French and Belgian people have a

<sup>7</sup> For the senior men group, the Kolmogorov-Smirnov Z-test reveals the significant difference ( $z = 1.4061$ ,  $p = 0.0183$ ).

different meaning about the appropriateness of some medium to look for a supplier<sup>8</sup>. This is less so for 'media' that still have another role to play in their lives (such as Friends and Family), but more so for media that are made to communicate this kind of information (such as Yellow Pages and websites such as e-bay).

Getting a good place in the Yellow Pages comes at a price. Similarly, getting high in Search Engine rankings can be a tedious, costly effort. Therefore, it is interesting for companies to know whether the online or the offline Yellow Pages are more popular or whether Internet search engines are more popular or whether Friends and Family are believed to be most appropriate source of information to find a supplier. A number of comparisons by means of the paired Wilcoxon-test are shown in Table 7.

A comparison of the appropriateness of the online and offline versions of the Yellow Pages to find a supplier reveals there is only a (statistically significant) difference ( $p < 0.0005$ ) in stated appropriateness between online and

offline for senior Belgian females. Notably, this difference is moderate. That is, senior Belgian females are considerably more in favor of the offline version than the online version of the Yellow Pages to find a supplier, whereas other response groups seem indifferent.

By all response groups, except the senior French response groups, the Internet is deemed more appropriate to find a supplier than the online Yellow Pages ( $p < 0.005$ ). Interestingly, this difference is quite large among Belgian respondents, and moderate for the two young French response groups. For example, on average 40% of young Belgian female responses indicate that Internet search engines are 'very appropriate', but only 15% find the online versions of the Yellow Pages appropriate. Exactly the same reasoning goes for the offline version of the Yellow Pages, except for the fact that no statistically significant difference could be found for senior Belgian women between the appropriateness of an Internet search engine and the offline version of the Yellow Pages.

<sup>8</sup> There are also differences between different products but this paper focuses on differences between countries rather than on differences between products. Still, some interesting issues can be mentioned. First, in general, chances that people and companies use the Yellow Pages to find a supplier are remote. There is one big exception to this rule: to find a taxi, about 50% of French companies and French (young and senior) people say that the *offline* Yellow Pages are considered very appropriate. Also, about 50% of French companies and French youngsters say that the *online* Yellow Pages are considered very appropriate. Of the senior French people, 36% consider the online version of the Yellow Pages very appropriate to find a taxi. Secondly, only for a few products and services it is stated that there is a 'fixed supplier'. Given the nature of the products that were surveyed this is no real surprise when it comes to private persons. However, for companies one might expect more companies to have fixed suppliers for all kinds of (indirect) products. Notably, more than 50% of Belgian respondents (companies, and young and senior people) and of French companies say they have a fixed doctor. Of the French youngsters, only 38% say they have a fixed doctor and of the senior French people only 29% say they have a fixed doctor. Finally, using another site than an Internet search engine and the online Yellow Pages to find a supplier is hardly considered. Two product groups score here particularly better than other products: to buy CDs and DVDs and to buy computers, 35% of French youngsters and 26% of Belgian youngsters state that 'another website' is very appropriate.

	Yellow Pages Online vs. Yellow Pages Offline	Internet search engine vs. Yellow Pages Online	Internet search engine vs. Yellow Pages Offline	Fixed supplier vs Internet search engine	Internet search engine vs Friends and Family	Other site vs. Internet search engine
Belgian Young Female	Z Estimated difference size Exact Sig. (2-tailed)	-0.3590 (a) 0.0314 0.7215 0.0000	-6.8023 (b) 0.5943 0.0000	-7.9176 (a) 0.6918 0.0000	-1.6556 (b) 0.1446 0.0981	-9.3330 (a) 0.8154 0.0000
Belgian Young Male	Z Estimated difference size Exact Sig. (2-tailed)	-0.8924 (a) 0.0516 0.6854	-9.1951 (b) 0.8911 0.0000	-9.7094 (a) 0.7237 0.0000	-5.6202 (b) 0.4189 0.0000 (A)	-10.5224 (a) 0.7843 0.0000
Belgian Senior Female	Z Estimated difference size Exact Sig. (2-tailed)	-3.8166 (a) 0.4069 0.0001	-4.3658 (b) 0.4654 0.0000	-3.5025 (a) 0.3734 0.1057	-0.0141 (a) 0.0015 0.9897	-6.7995 (a) 0.7248 0.0000
Belgian Senior Male	Z Estimated difference size Exact Sig. (2-tailed)	-1.3152 (a) 0.1550 0.1909	-4.3874 (b) 0.5171 0.0000	-4.4981 (a) 0.5301 0.0000	-2.3205 (b) 0.2735 0.0197	-6.3141 (a) 0.7441 0.0000
French Young Female	Z Estimated difference size Exact Sig. (2-tailed)	-1.5781 (b) 0.1692 0.1154	-3.0873 (b) 0.3310 0.0017	-6.6178 (a) 0.7095 0.0000	-1.1140 (b) 0.1194 0.2673	-7.6037 (a) 0.8152 0.0000
French Young Male	Z Estimated difference size Exact Sig. (2-tailed)	-1.4878 (b) 0.1155 0.1373	-4.8194 (b) 0.3741 0.0000 (A)	-9.6279 (a) 0.7473 0.0000	-3.8846 (b) 0.3015 0.0001 (A)	-10.2852 (a) 0.7983 0.0000
French Senior Female	Z Estimated difference size Exact Sig. (2-tailed)	-0.3445 (a) 0.0703 0.7444	-1.4267 (b) 0.2912 0.1593	-1.4814 (a) 0.3024 0.1431	-0.0650 (b) 0.0133 0.9555	-3.10186 (a) 0.6332 0.0009
French Senior Male	Z Estimated difference size Exact Sig. (2-tailed)	-0.7367 (a) 0.1969 0.4822	-0.7383 (b) 0.1973 0.4954	-0.3846 (a) 0.1028 0.7231	-0.5949 (a) 0.1590 0.5728	-2.4308 (a) 0.6496 0.0117
Population Sample	Z Estimated difference size Exact Sig. (2-tailed)	-0.4691 (a) 0.05 0.6424	-4.4793 (b) 0.4775 0.0000	-4.8389 (a) 0.5158 0.0000	-2.0339 (b) 0.2168 0.0416	-6.8087 (a) 0.7258 0.0000

**Table 7: Wilcoxon-test, comparing the stated appropriateness of different media to find a supplier (for specific response groups). (a)-based on positive ranks, b)-based on negative ranks; A-asymptotic value used instead of exact value).**

Looking for a supplier via an Internet search engine is generally considered more applicable than having a fixed supplier. The difference between both is statistically significant ( $p < 0.0001$ ) and large for all young response groups. The difference is smaller, but still statistically significant ( $p < 0.0005$ ) for the senior Belgian response groups. For senior French response groups, there is no significant difference.

A comparison of the stated appropriateness of "Internet search engines" and "Friends and Family" to find a supplier shows a moderate, statistically significant higher appropriateness of Internet search engines by the two young male response groups ( $p < 0.0005$ ) and the senior Belgian male response group ( $p < 0.05$ ). For all female response groups and the senior French male response group, no significant difference can be concluded. This may give the impression that women rely more upon Friends and Family to find suppliers than men. However, a Mann-Whitney-test<sup>9</sup> (not reported in the tables) to compare the usage of this medium by different genders, shows there is no statistically significant difference ( $U=930,5$ ;  $z=-0.314$ ;  $p=0.756$ ;  $n=88$ ). Still, performing the Mann-Whitney-test for Belgium and France separately gives a different picture. Belgian women rely significantly more on Friends and Family to find a supplier than Belgian men (Mann-Whitney  $U=5353$ ,  $z=-2.207$ ,  $p=0.014$  one-tailed;  $n=226$ ). For French men and women,

no statistically significant difference is detected between men and women's recourse to Friends and Family to find a supplier (Mann-Whitney  $U=238$ ;  $z=-0.094$ ;  $p=0.465$  one-tailed;  $n=44$ ), but this may be due to the small sample size.

Table 6 showed that French respondents are more likely to turn to 'other websites' (such as e-bay) to find a supplier than Belgian respondents. Still, the results in Table 7 indicate that even for French respondents 'other websites' only play a marginal role. There is a large, statistically significant difference between the stated usage of an Internet search engine and the use of 'other websites' to find suppliers for all response groups. It should be noted that for senior French people there is no statistically significant difference between Internet search engines and any of the other media in Table 7, except for 'other sites'. For all response groups the difference is large, showing the fact that other sites, such as e-bay are remotely considered.

As a side note, the last row of Table 7 shows the results of a Wilcoxon-test on a subset of the data, containing 63% records of senior respondents (42-54 years, 63% of the years covered in the research) and 37% of young respondents (18-25, 37% of the years covered in the research), equally distributed among Belgium and France. This test shows that if one would not split the sample into subgroups, poor conclusions could be drawn. For some

<sup>9</sup> The test was performed on a subset of the data, containing 63% records of senior respondents (age 42-54, 63% of the years covered in the research) and 37% of 'young' respondents (age 18-25, 37% of the years covered in the research).

comparisons among media no statistical significance is concluded, whereas there is a statistical significant difference for subpopulations. The other way around, sometimes statistical significance would be concluded, while this is not appropriate for all subpopulations.

#### 4.3. Different ways to make a purchase

The last aspect of the purchasing process that was investigated concerned the purchasing act itself. In Table 8 Belgian and French response groups are compared on how appropriate they find a medium to make a purchase. Appendix F shows the detailed results of the Mann-Whitney tests. From these tables one can conclude that:

- On average 71% of Belgian responses show that the product was bought or would be bought through personal contact with the seller, whereas this is only 62% for French responses. Similarly, only 18% of Belgian responses indicate that buying through personal contact with the seller would not at all be considered, whereas this is 29% for French responses. Differences between the two countries are statistically significant for several response groups ( $p < 0.05$ ) and are quite large for the senior female respondents. The difference between senior male respondents is, in contrast, not statistically significant. For company representatives there is only a statistically significant difference on the 'very appropriate' answers (with

		Personal contact = 1	Personal contact = 4	Internet = 1	Internet = 4
Young Females	Mean Belgium	0.7392386	0.1389313	0.1032061	0.6977099
	Mean France	0.6721724	0.2298862	0.2133345	0.639069
	Exact Sig. (2-tailed)	0.1234 (A)	<b>0.0097</b>	<b>0.0000</b>	<b>0.0418 (A)</b>
Young Males	Mean Belgium	0.6942222	0.1797778	0.1357778	0.6917833
	Mean France	0.6246193	0.273741	0.2028508	0.6325301
	Exact Sig. (2-tailed)	<b>0.0333 (A)</b>	<b>0.0047 (A)</b>	<b>0.0000 (A)</b>	<b>0.0113 (A)</b>
Senior Females	Mean Belgium	0.7322727	0.1445455	0.0781818	0.7713636
	Mean France	0.5316667	0.3633333	0.2333333	0.615
	Exact Sig. (2-tailed)	<b>0.0018</b>	<b>0.0000</b>	<b>0.0002</b>	<b>0.0152</b>
Senior Males	Mean Belgium	0.7183333	0.1844444	0.1238903	0.7227778
	Mean France	0.6542143	0.3000071	0.1657214	0.7742143
	Exact Sig. (2-tailed)	0.1965	0.0555	<b>0.0697 (B)</b>	0.8593
Company representatives	Mean Belgium	0.666182	0.231273	0.117455	0.698182
	Mean France	0.603299	0.280412	0.194227	0.630515
	Exact Sig. (2-tailed)	<b>0,0542 (A,B)</b>	0,0851	<b>0,0003</b>	<b>0,0545 (A,B)</b>
Overall Mean Belgium		0,7100	0,1758	0,1117	0,7164
Overall Mean France		0,6172	0,2895	0,2019	0,6583

**Table 8: Average scores of different media to make the buy. P-values for comparison across countries calculated with the Mann-Whitney test. (A) denotes the result of the asymptotic method instead of the exact method. (B) denotes a difference that was concluded to be significant with the Kolmogorov-Smirnov Z-test. Overall mean = unweighted mean of different response groups.**

the Kolmogorov-Smirnov Z-test;  $z=1.4043$ ;  $p=0.0195$ )

When buying on the Internet is considered, the picture is turned around. On average 20% of French responses show that the product was bought or would be bought through a website, whereas this is only 11% for Belgian responses. In a similar vein, 72% of Belgian responses indicate that websites would not at all be considered to make the purchase, whereas this is 66% for French responses. Statistically significant differences are noted for all user groups ( $p<0.05$ )<sup>10</sup>.

A per-response-group comparison among private buyers of the appropriateness of different ways to make a buy shows a big (statistically significant) difference between online and offline buying. That is, buying offline is in both countries still by far considered to be the most appropriate way to make a buy<sup>11</sup>. The results of the Wilcoxon-test are shown in Table 9.

In conclusion we can say that Belgians find the Internet less appropriate than French people to actually buy a product or service but

Belgian Young Female	Z	-9.7328	Median Personal:	0.84
	Estimated difference size	0.8504	Median Internet:	0.08
	Asymp. Sig. (2-tailed)	0.0000		
Belgian Young Male	Z	-10.8629	Median Personal:	0.74
	Estimated difference size	0.8097	Median Internet:	0.08
	Asymp. Sig. (2-tailed)	0.0000		
Belgian Senior Female	Z	-7.9586	Median Personal:	0.88
	Estimated difference size	0.8484	Median Internet:	0.04
	Asymp. Sig. (2-tailed)	0.0000		
Belgian Senior Male	Z	-7.0177	Median Personal:	0.80
	Estimated difference size	0.8270	Median Internet:	0.08
	Asymp. Sig. (2-tailed)	0.0000		
French Young Female	Z	-7.6277	Median Personal:	0.76
	Estimated difference size	0.6178	Median Internet:	0.20
	Asymp. Sig. (2-tailed)	0.0000		
French Young Male	Z	-9.9330	Median Personal:	0.68
	Estimated difference size	0.7709	Median Internet:	0.18
	Asymp. Sig. (2-tailed)	0.0000		
French Senior Female	Z	-2.6928	Median Personal:	0.60
	Estimated difference size	0.5497	Median Internet:	0.18
	Asymp. Sig. (2-tailed)	0.0088		
French Senior Male	Z	-2.9834	Median Personal:	0.74
	Estimated difference size	0.7973	Median Internet:	0.12
	Asymp. Sig. (2-tailed)	0.0011		

**Table 9: Wilcoxon-test for per-response-group comparison of the appropriateness of different ways to make a buy. (All based on positive ranks.)**

<sup>10</sup> For the senior men the Kolmogorov-Smirnov test returned a  $z=1.2363$  and  $p=0.0353$ . For the company representatives, the Kolmogorov-Smirnov test returned a  $z=1.448$  and  $p=0.014$ .

<sup>11</sup> Figures for the company representative responses are most similar. Tests show that buying via personal contact is considered more appropriate than buying via a website. Moreover, buying via a website is considered more appropriate than buying via an e-procurement system.



that responses from both countries show that buying via the Internet is still considerably less appropriate than buying through personal communication.

## 5. DISCUSSION

The hypothesis formulated in Section 2 can clearly be rejected. The research results show that there are statistically significant differences in all steps of the e-commerce process in the two neighboring countries. For example, there are fewer responses in Belgium saying that it is appropriate to buy on the Internet than responses saying the same in France. Interestingly, this is true for all response groups: for both age groups, for both genders and for both, private consumers and company representatives.

This finding raises the question why differences are noted. Internet access availability is one of the factors that determine Internet usage. Internet penetration rates in Belgium and France are, however, similar. According to [Internetworldstats.com](http://Internetworldstats.com) the Internet penetration rate was 54,7% in France in November 2007, and was 52.8% in Belgium in December 2007. The countries are on places 37 and 39 in the list of countries with the highest Internet penetration rates [[www.Internetworldstats.com](http://www.Internetworldstats.com)]. Furthermore, France and Belgium take respectively places 23 and 24 with scores of 4.99 and 4.93 on the 2006-2007 Networked Readiness Index of the World Economic Forum (World Economic Forum, 2007), what suggests the countries have a comparable level of ICT development.

Also according to this report, the number of *broadband* subscribers per 100 inhabitants is comparable: 19.13 for Belgium, 20.91 for France. This suggests that the detected e-commerce behavior differences between the two countries cannot be brought back to differences in currently available IT infrastructure.

The question arises whether even small differences in culture can lead to significant differences in e-commerce behavior. While many researchers would consider Belgium and France to be similar in terms of Hofstede's dimensions (as illustrated by the fact that Hofstede clusters them together), they do not score exactly the same on the different dimensions. For example, Belgium scores 8 points higher on Hofstede's Uncertainty Avoidance Index and 11 points higher on Hofstede's Masculinity Index than France. The question arises how strong the relation is between culture and e-commerce behavior. Given that prior research compared countries that are culturally very different, some (wrongly) draw the conclusion that countries that only show small differences show similar e-commerce behavior. It is not possible on the basis of our research to assess whether a difference of 8 points on the Hofstede dimensions should be considered substantial (or not) as there may still be other drivers for the difference. One culture-related element that may be causing differences is the fact that culture is in flux. While the concept of culture is typically related to 'existing' common beliefs and practices, in a 'flattening world' (as described by Friedman, 2006) common beliefs and

practices get challenged. France and Belgium's culture evolution may be different. This difference in culture evolution may go hand in hand with differences in e-commerce behavior. While we cannot say what is really causing the differences, the important final conclusion is that it is wrong to assume that people from countries with only a small difference in scores on Hofstede's cultural dimensions will not show significant differences in on-line buying behavior.

### 5.1. Contributions to practice

From a practitioner's viewpoint, there are important consequences for companies that would like to sell in neighboring countries. Estimating the number of future Internet sales abroad on the basis of inland Internet sales would lead to a wrong decision on how many costs are justifiable to create a tailored website. This proves even to be the case among countries with a 'similar' (but somewhat different) Hofstede profile. Furthermore, witnessing that customers switch your local brick-and-mortar shop for your website shop does not imply that this will be the same abroad and that a percentage of shops abroad can be closed on the basis of such reasoning.

In addition to findings concerning differences in buying, there are also several statistically significant differences with respect to how information is gathered in the course of the e-commerce process. When it comes to *the* global medium, Internet search engines, there are almost no statistically significant differences noted between the two countries: Belgian and

French respondents say it has a similar appropriateness. Investing in 'search engine optimization' of standardized web sites could thus result in similar increases in site visits in both countries. When comparing the use of Internet search engines to find a supplier with other media, Internet search engines are considered *much more* appropriate than any of the other media by Belgian respondents, but this is not at all the case among senior French respondents. That is, for senior French respondents, other media are considered as appropriate as Internet search engines. Therefore, companies operating in culturally similar countries cannot assume that potential customers in the two countries will follow the same behavior in looking for the supplier. As a consequence, they must be careful on how to invest in different ways to be found.

Chances of being looked for in the online Yellow Pages may be much higher in one country than in another even when comparing neighboring countries (of which often a similar customer behavior is assumed). As an example, good experiences with the Yellow Pages in France may not be replicated (to the same extent) with investments in the Belgian Yellow Pages. Especially with the online Yellow Pages there are big differences between respondents from both countries. For example, while 25% of young Frenchmen say that the online Yellow Pages are very appropriate to find a supplier, only 11% of the young Belgian men say this. It is also remarkable that senior Belgian women do not seem to make the switch to the online Yellow Pages although they would use Internet

search engines to find suppliers as often as they would use the offline version of the Yellow Pages.

Furthermore, for practitioners it is important to understand the importance of a local shop to give product and service information. French respondents find communication with the seller much more appropriate to gather product information than Belgian respondents. Consequently, opening or having a local brick-and-mortar shop in France may be appropriate for reasons of communicating product information. The other way around, buying on the Internet is considered less appropriate by Belgian respondents, so opening or having a local brick-and-mortar shop in Belgium may be more important for reasons of selling, rather than communicating product information. Furthermore, it should be noted that Belgian respondents find it somewhat more important than French respondents that there is sufficient product information available on the website of the seller where they buy. These findings should be kept in mind when evaluating the performance of local shops and Internet shops. It is quite possible that, as the brick-and-mortar shops have a different role to play, the role of employees, their necessary knowledge, the locally required product stock etcetera may be different in two neighboring countries (such as France and Belgium). Further research on this is recommended.

## 5.2. Contributions to theory

The findings also have important consequences for researchers. Our

research proves that one should have a sufficiently large sample of people of different countries to get an accurate image of a 'region' (e.g. with the size of Europe), even if all countries would score almost the same on Hofstede's cultural dimensions (or would be put in the same Hofstede cluster). That is, the assumption that there are no differences between such countries would be wrong. Moreover, while differences between Belgium and France are small in terms of Hofstede's cultural dimensions; big differences also show up within Europe and several countries have a unique mix of scores. For example, (amongst others) Denmark only scores 23 on the Uncertainty Index, whereas France scores 86. Our research suggests that a comparison of the purchasing process between two regions, such as Asia and Europe for example, cannot be scientifically correct if not enough respondents are taken *in each country of the region*. By all means, it is of profound importance for any research concerning Internet adoption to identify at least the country in which the survey was done.

## 6. LIMITATIONS TO THE STUDY AND FURTHER RESEARCH

The findings in this paper concern 'the average product'. By aggregating the rough data in another dimension (namely by grouping responses of different respondents within a response group per product), it is possible to see that there are big differences between different products. This paper mentions

a few eye-catching differences in footnote 5, but in general, responses for all products are different. The goal of this paper was, however, not to investigate product issues, but to investigate differences among countries. In reality, companies generally do not sell 'the average product' and the lessons from this paper should not be generalized to the purchasing process of just any product.

It was attempted to get a large number of respondents in both countries. The statistical tests were finally run on data from 388 French and 581 Belgian respondents, which seems appropriate. Still, often the medians of Belgian and French senior males were quite distinct, but no statistically significant difference was found, which may be due to the fact that there were only 14 senior French males in the sample.

We note that findings from this study, like all results from studies on the influence of culture, cannot just be applied to a specific individual in the population. "The effect of culture is not homogeneous but rather dependent on the extent to which the individual subscribes to various cultural values" (Srite & Karahanna, 2006, p681). Furthermore, we want to point the reader to the fact that the Belgian sample is actually drawn from the Flemish population. This means the Walloon part of the population is not present in the sample. Moreover, the age distributions are not similar to those of the country's populations. The figures presented in this paper should thus not be regarded as absolute figures for France or Belgium regarding

people's approach to e-commerce. This is, however, not a problem from the point of view of our research question: this paper tests the existence of differences among similar demographic subgroups. The main point is that – while France and Belgium look culturally similar in terms of Hofstede's dimensions – it may be inappropriate to treat people from both countries as if they are the same.

The survey investigated the use of the Yellow Pages. It should be noted that the Yellow Pages look 'similar' in both countries, but that no measure of similarity (e.g. in terms of usability) was calculated and that it is thus not necessarily so that the Yellow Pages have the same properties in both countries.

For what regards further research, we point out that the research at hand does not show causes for specific e-commerce behavior. Future research could focus on the causes of the observed differences, such as variances in national regulations, in languages, etc. Specific regions in the world allow one to research this. It could for example be interesting to investigate differences in e-commerce behavior between people from four closely related regions such as France, the Netherlands, Flanders and Wallonia where some people share the same language and some people share the same regulations. Collecting an appropriately stratified sample in such a study would immediately also allow for generalizing figures to the level of entire countries.

The research reported in this paper does not allow us to determine whether

the detected difference of 8 points on Hofstede scores should be considered substantial or not. A large comparative study including many different countries would be able to give an accurate image of the (size of) relations between specific Hofstede scores and e-commerce behavior. Given the importance of avoiding uncertainty in buying online, Hofstede's Uncertainty Avoidance Index might deserve special attention in such a study.

As stated in Section 2, many researchers have tried to document differences in culture. It may be appropriate to investigate the relation between e-commerce and variables identified by other researchers (than Hofstede) as well. It is currently unclear what is 'the best' framework to discuss culture. While Hofstede is *the* classic framework, Hofstede used data that was gathered between 1967 and 1973. One more recent project is the GLOBE project, which gathered data in the period 1994-1997. While different researchers typically classify Belgium and France as culturally similar, it may be interesting to investigate the role of specific variables identified in the GLOBE project (and other projects).

## 7. CONCLUSION

This paper investigates differences in e-commerce behavior in two neighboring countries through a survey of 969 private consumers and company representatives on 50 products.

This research proves that big differences exist in e-commerce behavior *even between consumer groups from two neighboring countries*

*which seem rather similar* in terms of Hofstede's cultural dimensions. Differences between consumer groups were found in each of the steps of the procurement process we researched: finding product or service information, finding suppliers and actually buying the product. This result has far-reaching consequences for practitioners and researchers. We can say that, in general, for any combination of two countries, companies that consider selling abroad (thus even to consumers that are only 30 kilometers away in a neighboring country) should be aware of possible big differences in e-commerce behavior when they evaluate some investment option. When evaluating the performance of brick-and mortar shops in different countries it should be kept in mind that such shops may have different roles to play in different countries (in terms of information distribution vs. selling). Given the costs to create and to maintain culturally customized websites, purchasing behavior should be thoroughly investigated in target countries upfront. In one country, company websites may be considered appropriate to look up product information but not to make a purchase, while this may be less the case in another country. Companies may profit from investigating the importance of different media for customers to find suppliers. Notably, Belgian respondents consider Internet search engines *much more* appropriate to find suppliers than any of the other media, but this is not at all the case for senior French respondents. That is, for senior French respondents, other media are considered as appropriate as Internet search engines. Therefore,

companies operating in culturally similar countries cannot assume that potential customers in the two countries will follow the same behavior in looking for the supplier. For researchers there is the important message that they should not assume that there are no differences in e-commerce behavior between countries that seem culturally similar (because they are classified in the same cultural cluster or have very similar scores on cultural variables). Also, e-commerce researchers should always make explicit in what country their research was done.

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## Appendix A: free translation of the products and services on the questionnaire to English

### Group 1:

Diving material
Lagging material
Architects and architectural firms
Artists
Second-hand cars
Car accessories (spoilers, rims,...)
Car rental
Tax consultant
Books
Cafés and Cafeterias
CD's and DVD's
Computer training
Computers
Construction
Animal aid
Emigration bureau
Fitness centre
Camera equipment and film equipment repairation
Garage doors
Hotels
Woodworking - machines
Boarding schools
Airline company
Meditation techniques
Snack bar

### Group 2:

Photo-reportage, photographer
Golf course
Jeweller
Photo prints
Copy centre
Osteopathy practitioner
Massaging machines
Furniture
Paint Brush – factories and wholesalers
Press bureau
Travel agency
Restaurants
Ship's engine – repair
Sports club and relaxation club
Taxis
Televisieons, radio-hardware
Textile printing
Domestic caterer
Packaging and Packing material
Fishing-tackle
Legal adviser
Greetings card and postcard
Recruitment and selection office
Family doctor
Air conditioning

## Appendix B

**Table 10: Tasks in the e-commerce process and options to evaluate in the survey (left column) vs. in the paper reported options (right column)**

<b>To gather information about the product or service:</b>	
Offline: magazines & books	/
Offline: Friends and Family	Friends and Family
Offline: Sellers	Communication with the seller
Online: Webpages found with Google	The Internet
Online: On a site I knew	
Online: Webpages found with another search engine (Yahoo, MSN,...)	
Online: Other	
<b>To find a supplier:</b>	
Offline: magazines & books	/
Offline: Friends and Family	Friends and Family
Offline: Other people	/
Offline: The Yellow Pages	Yellow Pages offline version
Offline: I already had a fixed supplier	Fixed supplier
Offline: Other	/
Online: Google	Internet search engine
Online: Other search engine (Yahoo, MSN,...)	Other website (such as electronic marketplaces like e-bay or websites they already knew)
Online: Yellow Pages online	
Online: An online auction (e-bay, ...)	
Online: Other website I knew	
<b>To make the purchase:</b>	
Face-to-face contact or via telephone	Personal contact with the seller
Via e-mail	/
Via the website of the seller itself	Through a website
Via another website (e.g. e-bay)	E-procurement solution (only for company representatives)
E-procurement solution (only for company representatives)	
Other	

## Appendix C

**Table 11: Detailed results of the Mann-Whitney test to compare the appropriateness of different media to find product or service information across countries. (A) denotes the result of the asymptotic method instead of the exact method. (B) denotes a difference that was concluded to be significant with the Kolmogorov-Smirnov Z-test.**

		Friends & Family = 1	Friends & Family = 4	Commun. Sel. = 1	Commun. Sel. = 4	Internet = 1	Internet = 4
Young Females	Median Belgium	0.28	0.24	0.24	0.36	0.44	0.16
	Median France	0.28	0.28	0.44	0.2	0.4	0.2
	Mann-Whitney U	5534	5266.5	3687	4411.5	5056.5	4969
	Z	-0.36154	-0.94918	-4.41939	-2.8285	-1.40963	-1.60723
	Estimated difference size	0.024486	0.064287	0.299319	0.191435	0.095472	0.108856
	Exact Sig. (2-tailed)	0.7187	0.3435	<b>0.0000</b>	<b>0.0046</b>	0.1591	0.1082
Young Males	Median Belgium	0.2	0.32	0.24	0.36	0.4	0.12
	Median France	0.24	0.32	0.32	0.3	0.38	0.18
	Mann-Whitney U	14193.5	14828	10930.5	12218.5	14327.5	13565
	Z	-0.80551	-0.12069	-4.32133	-2.93171	-0.65965	-1.4875
	Estimated difference size	0.043305	0.006488	0.232316	0.157809	0.035463	0.079968
	Exact Sig. (2-tailed)	0.4205 (A)	0.9030 (A)	<b>0.0000 (A)</b>	<b>0.0034 (A)</b>	0.5095 (A)	0.1369 (A)
Senior Females	Median Belgium	0.28	0.32	0.18	0.52	0.32	0.28
	Median France	0.24	0.34	0.28	0.42	0.32	0.36
	Mann-Whitney U	1039	965.5	782	805	1004.5	1014
	Z	-0.12088	-0.84292	-1.95136	-1.78188	-0.36595	-0.29848
	Estimated difference size	0.011422	0.06075	0.184387	0.168372	0.034579	0.028204
	Exact Sig. (2-tailed)	0.9058	0.5238	0.0508	<b>0.0749 (B)</b>	0.7175	0.7682
Senior Males	Median Belgium	0.2	0.32	0.16	0.48	0.36	0.2
	Median France	0.28	0.36	0.36	0.46	0.3	0.32
	Mann-Whitney U	381	493.5	315.5	458.5	476.5	351.5
	Z	-1.44381	-0.12309	-2.2203	-0.53299	-0.32225	-1.79111
	Estimated difference size	0.15569	0.013273	0.239421	0.057474	0.034749	0.193141
	Exact Sig. (2-tailed)	0.1511	0.9054	<b>0.0265</b>	0.5998	0.7521	0.0735
Company representatives	Median Belgium	0.2	0.4	0.24	0.44	0.36	0.24
	Median France	0.2	0.4	0.36	0.28	0.32	0.2
	Mann-Whitney U	5077	5243.5	3881	4171	5067	5026.5
	Z	-0.60207	-0.21303	-3.3869	-2.71038	-0.62399	-0.71927
	Estimated difference size	0.04187	0.014807	0.235406	0.188384	0.043371	0.049992
	Exact Sig. (2-tailed)	0.5483	0.8321	<b>0.0007</b>	<b>0.0066</b>	0.5338	0.4731

## Appendix D

**Table 12: Mann-Whitney test to compare how much information the chosen supplier has online. (A) denotes the result of the asymptotic method instead of the exact method.**

		No info online	Some info online	Much info online	Don't remember	Did not check.
Young Females	Median Belgium	0	0,12	0,3	0	0,44
	Median France	0,04	0,2	0,28	0	0,4
	Mann-Whitney U	3899,0	4202,5	4690,0	5052,0	4387,0
	Z	-3,4238	-2,0979	-0,9326	-0,0776	-1,6508
	Estimated difference size	-0,2368	-0,1451	-0,0645	-0,0054	-0,1142
	Exact Sig. (2-tailed)	<b>0,0006</b>	<b>0,0358</b>	<b>0,3522</b>	0,9388	0,099
Young Males	Median Belgium	0,04	0,12	0,28	0	0,36
	Median France	0,08	0,16	0,24	0	0,32
	Mann-Whitney U	10063,0	10758,5	11992,0	12193,0	11414,0
	Z	-3,1753	-2,2756	-0,7617	-0,5597	-1,4671
	Estimated difference size	-0,1778	-0,1274	-0,0426	-0,0313	-0,0821
	Exact Sig. (2-tailed)	<b>0,0014</b>	<b>0,02287 (A)</b>	<b>0,4463</b>	0,5763	0,1423 (A)
Senior Females	Median Belgium	0,04	0,08	0,16	0	0,32
	Median France	0,08	0,12	0,2	0	0,4
	Mann-Whitney U	734,5	843,5	843,5	916,0	887,0
	Z	-1,5951	-0,7005	-0,6967	-0,1624	-0,3635
	Estimated difference size	-0,1521	-0,0668	-0,0664	-0,0155	-0,0347
	Exact Sig. (2-tailed)	0,1115	0,4876	0,4899	0,874	0,7197
Senior Males	Median Belgium	0,04	0,16	0,26	0	0,32
	Median France	0,08	0,12	0,24	0,04	0,28
	Mann-Whitney U	420,0	401,0	440,5	348,5	392,5
	Z	-0,3135	-0,5413	-0,0438	-1,2918	-0,6432
	Estimated difference size	-0,0338	-0,0584	-0,0047	-0,1393	-0,0694
	Exact Sig. (2-tailed)	0,7598	0,5947	0,968	0,1996	0,5268
Company representatives	Median Belgium	0,04	0,16	0,32	0,00	0,28
	Median France	0,08	0,16	0,24	0,00	0,24
	Mann-Whitney U	4175,0	4813,5	3801,0	4783,5	4734,0
	Z	-1,8655	-0,2623	-2,7507	-0,3686	-0,4575
	Estimated difference size	-0,1313	-0,0185	-0,1935	-0,0259	-0,0322
	Exact Sig. (2-tailed)	0,0621	0,7940	<b>0,0058</b>	0,7135	0,6484

# Appendix E

**Table 13.: Mann-Whitney comparison across countries of different media to find a supplier. (A) denotes the result of the asymptotic method instead of the exact method. (B) denotes a difference that was concluded to be significant with the Kolmogorov-Smirnov Z-test.**

	Friends & Family = 1	Friends & Family = 4	Yellow Pages Offline = 1	Yellow Pages Offline = 4	Yellow Pages Online = 1	Yellow Pages Online = 4	Internet search = 1	Internet search = 4	Other site = 1	Other site = 4	Fixed Supplier = 1	Fixed Supplier = 4	
Young Females	Median Belgium	0.32	0.2	0.04	0.6	0.04	0.28	0.2	0	1	0.08	0.84	
	Median France	0.28	0.32	0.16	0.56	0.2	0.28	0.28	0	0.88	0.12	0.8	
	Mann-Whitney U	5870	4816.5	4235	4907	3785.5	5581	4919	4122.5	4520	4950	5252.5	
	Z	-0.0626	-1.93818	-3.2617	-1.71448	-4.30219	-2.43053	-0.23608	-1.71465	-4.0534	-2.70845	-1.67216	-0.96804
	Estimated difference size	0.00424	0.13127	0.22091	0.117948	0.291381	0.164616	0.015989	0.116131	0.274531	0.183439	0.113253	0.066783
	Exact Sig. (2-tailed)	0.9506	0.0525 (B)	0.0010	0.0816 (A, B)	0.0000	0.0149	0.8142	0.0985	0.0000	0.0066	0.0946	0.3241 (A)
	Median Belgium	0.22	0.32	0	0.8	0	0.82	0.38	0	0	0.96	0.04	0.88
	Median France	0.24	0.32	0.12	0.52	0.16	0.48	0.32	0.24	0.04	0.86	0.04	0.88
	Mann-Whitney U	14570.5	14343	10873.5	10497	8900.5	10246.5	14125	14048	11457.5	11255	13702.5	14286
	Z	-0.39858	-0.64315	-4.75458	-4.80487	-6.75395	-5.08789	-0.87806	-0.96495	-4.23382	-4.03985	-1.37161	-0.71122
Young Males	Estimated difference size	0.021428	0.034576	0.255608	0.258312	0.363095	0.273527	0.047205	0.051876	0.227611	0.217189	0.073738	0.036235
	Exact Sig. (2-tailed)	0.6902 (A)	0.5201 (A)	0.0000	0.0000 (A)	0.0000	0.0000 (A)	0.3799 (A)	0.3346 (A)	0.0000	0.0001 (A)	0.1705	0.4769 (A)
	Median Belgium	0.24	0.32	0.12	0.54	0	0.9	0.14	0.36	0	1	0.08	0.78
	Median France	0.24	0.44	0.16	0.56	0.1	0.62	0.24	0.48	0	0.96	0.12	0.74
	Mann-Whitney U	952.5	1038.5	917.5	1018.5	698.5	754.5	984	978	876	880.5	943	
	Z	-0.73663	-0.12432	-0.99724	-0.26636	-2.74523	-2.1959	-0.51658	-0.55432	-2.29482	-4.02504	-1.26285	-0.80491
	Estimated difference size	0.069605	0.011748	0.094231	0.025169	0.2594	0.206548	0.048812	0.052378	0.21684	0.380331	0.119328	0.076057
	Exact Sig. (2-tailed)	0.4649	0.9031	0.3217	0.7927	0.0056	0.0283	0.6089	0.5828	0.0196	0.0001	0.2087	0.4243
	Median Belgium	0.2	0.28	0.06	0.56	0	0.64	0.24	0.28	0	1	0.08	0.84
	Median France	0.26	0.48	0.2	0.84	0.16	0.72	0.14	0.74	0	0.96	0.12	0.84
Senior Females	Mann-Whitney U	411.5	335	346	443	317.5	465	416.5	194	352	397	485.5	
	Z	-1.08685	-1.98093	-1.89544	-0.71463	-2.31277	-0.46049	-1.02901	-3.63511	-2.76652	-1.63375	-1.27064	-0.21733
	Estimated difference size	0.117198	0.213609	0.204391	0.07705	0.249392	0.049656	0.110981	0.391984	0.298322	0.176172	0.137016	0.023435
	Exact Sig. (2-tailed)	0.2818	0.0471	0.0678 (B)	0.4808	0.0196	0.6508	0.3085	0.0001	0.0079	0.1026	0.2074	0.8321
	Median Belgium	0.16	0.36	0	0.68	0	0.6	0.28	0.28	0	1	0.16	0.72
	Median France	0.2	0.4	0.12	0.56	0.16	0.6	0.24	0.36	0	0.92	0.16	0.72
	Mann-Whitney U	5022	4806.5	4075.5	4464	3632	4738.5	5066.5	4634	4115	3852.5	4774.5	5274
	Z	-0.73128	-1.23162	-3.0391	-2.03582	-3.63484	-1.39557	-0.82862	-1.63488	-3.70104	-3.68552	-1.3098054	-0.1421
	Estimated difference size	0.050828	0.085603	0.211232	0.141499	0.252639	0.096999	0.043553	0.113632	0.25724	0.256161	0.0910378	0.006876
	Exact Sig. (2-tailed)	0.4657	0.2188	0.0023	0.04177 (A)	0.0003	0.1628 (A)	0.5321	0.1023	0.0002	0.0002	0.1909	0.8877

## Appendix F

**Table 14: Mann-Whitney comparison across countries of ways to make the buy. (A) denotes the result of the asymptotic method instead of the exact method. (B) denotes a difference that was concluded to be significant with the Kolmogorov-Smirnov Z-test.**

		Personal contact = 1	Personal contact = 4	Internet = 1	Internet = 4
Young Females	Median Belgium	0.84	0.04	0.08	0.8
	Median France	0.76	0.12	0.2	0.68
	Mann-Whitney U	4998	4542	3537	4772
	Z	-1.54085	-2.5792	-4.79019	-2.03508
	Estimated difference size	0.10436	0.174686	0.324433	0.137832
	Exact Sig. (2-tailed)	0.1234 (A)	<b>0.0097</b>	<b>0.0000</b>	<b>0.0418 (A)</b>
Young Males	Median Belgium	0.76	0.1	0.08	0.76
	Median France	0.68	0.16	0.18	0.64
	Mann-Whitney U	12966	12350	10976.5	12590.5
	Z	-2.12867	-2.82811	-4.29725	-2.5319
	Estimated difference size	0.114438	0.15204	0.231021	0.138116
	Exact Sig. (2-tailed)	<b>0.0333 (A)</b>	<b>0.0047 (A)</b>	<b>0.0000 (A)</b>	<b>0.0113 (A)</b>
Senior Females	Median Belgium	0.88	0.08	0.04	0.88
	Median France	0.6	0.32	0.18	0.64
	Mann-Whitney U	624.5	496	564.5	718
	Z	-3.07867	-4.04399	-3.60938	-2.41406
	Estimated difference size	0.290907	0.382121	0.341054	0.228107
	Exact Sig. (2-tailed)	<b>0.0018</b>	<b>0.0000</b>	<b>0.0002</b>	<b>0.0152</b>
Senior Males	Median Belgium	0.8	0.08	0.08	0.76
	Median France	0.74	0.24	0.12	0.8
	Mann-Whitney U	393.5	343	351.5	488.5
	Z	-1.30122	-1.91263	-1.81414	-0.18217
	Estimated difference size	0.140315	0.206245	0.195624	0.019844
	Exact Sig. (2-tailed)	0.1965	0.0555	<b>0.0697 (B)</b>	0.8593
Company representatives	Median Belgium	0.78	0.12	0.08	0.76
	Median France	0.64	0.2	0.16	0.72
	Mann-Whitney U	4509.5	4600.5	3812.5	4511
	Z	-1.92497	-1.72222	-3.60699	-1.92293
	Estimated difference size	0.133795	0.119703	0.250703	0.133653
	Exact Sig. (2-tailed)	<b>0.0542 (A, B)</b>	0.0851	<b>0.0003</b>	<b>0.0545 (A, B)</b>

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