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A TWO-COUNTRY COMPARISON OF ONLINE SHOPPING BEHAVIOR

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ABSTRACT

The rapidly expanding use of the Internet for e-commerce has left academics and practitioners with many questions about consumer use of this new marketing channel. This study was intended to explore the Internet use, online purchasing and payment habits, and comfort level with e-commerce of certain long-term future consumers. 203 US and German college students participated in an online survey intended to explore the previously mentioned concerns. Similarities and differences between US and German students' online e-commerce practices are discussed and compared with results of prior research. Results show differences in usage patterns and purchase habits as well as comfort level with giving out personal information over the Internet. This study also seems to show a difference between groups in their degree of sophistication with e-commerce. Implications for further research are discussed.

I. INTRODUCTION

In January 1994, the Internet Shopping Network recorded the first online sales. The first day's revenues were less than a couple of hundred dollars. In the intervening decade, internet sales have risen dramatically, to \$113 billion in 2003. Final sales for 2004 are expected to increase by 27% from those figures, to \$144 billion (Sullivan, 2004). In fact, the US Department of Commerce now tracks e-commerce sales separately (US Department of Commerce, 2005). Though e-commerce is arguably still in its infancy, it was quickly regarded as being critical to organizational success by many CIOs (Shadler, 2000), CFOs (The Numbers, 1999) and industry executives, some of which believe that developing an effective e-commerce strategy is the most critical issue that they face in the near term (Velocci & Mecham, 1999). With e-commerce sales expected to hit \$316 billion within the next 5 years, this early recognition seems warranted (McAllister, 2005; Sullivan, 2004).

Brynjolfsson (1999), in a study of Internet 500 companies, found that companies expected three primary benefits to come from investing in e-commerce: reaching new customers and markets, increasing sales to existing customers, and improving consumer service. In order to fulfill these expectations, organizations need an in-depth knowledge of consumer online buying habits and patterns. In fact, a number of studies of this sort have been published recently (cf. Anger, 2005; Baloco, Rangone, Cardano & Valacca, 2004; Bellman, Lohse & Johnson, 1999; Brynjolfsson, 1999; Caudill & Murphy, 2000; Chen, 1999; FastFacts, 2000; Foreign, 2000; Hoffman, Novak & Peralta, 1999; Kloppe & McKinney, 2004; Limayem, Khalifa & Frini, 2000; Phelps, Nowak, & Ferrel, 2000; Park & Jun, 2003; Poll, 2000; Solomon, 2000; Studt, 1999; Szymanski & Hise, 2000; Tatnall & Lipa, 2003; Wang & Emurian, 2005; Web, 1999). Yet these studies barely begin the task of establishing expectations of online consumer behavior.

College students may be an especially appropriate sample to study for online consumption patterns and behaviors. These students will have higher incomes relative to non-college graduates, they are long-term future consumers and are more likely than older adults to be computer literate (Gareis, Korte & Deutsch, 2000), thus their behaviors should serve as indicators of the future of B2C e-commerce. These arguments provide an unusual rationale for using a student sample. In this instance, students may actually be the best predictor of future trends.

An additional complication to examining e-commerce is its international nature. For instance, the existing (but declining) difference in Internet penetration between the US and certain European countries has implications for e-commerce, and these implications beg for investigation. This study undertakes a portion of that investigation by investigating online purchase patterns and behaviors for early adopters (students) in two countries, Germany and the US.

II. THE STUDY

The roots of this study exist in a joint project between business students from a southern German university and a mid-western US university. Students were involved in an Internet-facilitated joint project to investigate German and US students' e-commerce habits and behaviors. Faculty members at both institutions supervised the development and administration of an online survey that business students from both universities then responded to.

1. SURVEY

The survey was developed after a study of relevant literature on cultural, technical and consumer differences between German and US citizens. Some of the

areas investigated in the thirty-nine-item questionnaire included Internet access habits and uses, purchasing and payment habits, and comfort levels with giving personal information online. The survey was administered in English, as fluency in English was a requirement at the German university.

The distributed nature of both the sample and the administrators suggested online administration of the survey. There were several other reasons that online administration was eventually adopted. The online approach was consistent with the content being investigated, and some consumers view online surveys as more interesting, important, and enjoyable than traditional surveys. Higher levels of respondent involvement potentially lead to more accurate results with higher response rates (CustomerSat.com, 2001; Edmonson, 1997; Szymanski & Hise, 2000). A modified snowball sampling strategy where students recruit other students to take the survey was pursued in order to attempt a rough matching of the samples. Snowball sampling relies on referrals from initial subjects to generate other subjects. This type of “linking” strategy is often used with hard-to-reach populations, similar to the geographically dispersed sample used in this study. Although snowball sampling may introduce bias into the study it can be effective in reaching groups having common characteristics (Atkinson and Flint, 2001). In this case, the computer-savvy, matched sample of US and German student researchers was expected to recruit like-minded subjects for the study.

2. SUBJECTS

Subjects were 81 German and 122 US undergraduate business students. The US and German samples were assessed for similarity in terms of age, gender, hours per week spent on the Internet and self-assessed expertise with the Internet. All differences failed to reach significant values. Table 1 provides descriptive data for the sample on these variables.

Table 1. Descriptive Data for Sample.

	German		US	
	Mean	Std. Dev.	Mean	Std. Dev.
Age	23.04	2.26	23.20	5.59
Hours per week on internet	8.05	5.41	7.75	5.9
Expertise with Internet 2 = intermediate 3 = advanced	2.43	.57	2.30	.56
	Male	Female	Male	Female
Gender	63%	37%	62%	38%

3. ANALYSIS STRATEGY

Based on the limited amount of research published on most items in the survey, the researchers had few prior expectations about the results. The study was regarded, therefore, as exploratory, and the analysis strategy was consistent with an exploratory study. Although the focus of the study was on differences between German and US students' practices, there is a substantial body of knowledge supporting an influence of gender on behaviors and attitudes that is quite broad (Venaktesh & Morris, 2000), and along with other demographic differences, in evidence in Europe (Gareis, Korte & Deutsch, 2000; ECIN, 2001). Another, large-sample international study found, however, that demographics did not seem to influence buying habits (Bellman et al., 1999). Because of these potentially conflicting findings, gender was also examined and, in most instances,, home country (Germany vs. US), gender, and the interaction of these two terms were treated as the independent variables in the analysis. The general procedure was for items dealing with the same topic and having the same core question to be evaluated with a MANOVA, with individual items not examined unless the multivariate F was significant.

III. RESULTS

Survey participants were asked about their Internet access habits and uses. Although German and US students spent about the same number of hours per week on the Internet, US students accessed the Internet a significantly greater number of times (15.83 vs. 12.28, $p=.026$). Participants were also asked how often they used the Internet for a number of purposes and responded on a three-point scale from 1=never to 3=often. A MANOVA was conducted using the 14 purposes as dependent variables (DVs) and home country (Germany vs. US) and gender as independent variables (IVs). Multivariate Fs for home country ($F=5.170$, $p<.001$) gender ($F=5.773$, $p<.001$) and the interaction of the two terms ($F=2.261$, $p<.01$) were significant, so individual items were examined for all three independent variables. The results of the survey are summarized in Table 2.

Table 2. Results of MANOVA of Differences Between German and US Subjects and Male and Female Usage of the Internet for Various Purposes. 1=never, 2=sometimes, 3=often.

	Total	German	US	German-US means Sig. Dif.	Male	Female	M-F means Sig. Dif	Gender – Country Sig. Interaction
	Mean	Mean	Mean		Mean	Mean		
University	2.63	2.64	2.63		2.57	2.73		
Shopping	1.68	1.82	1.58	**	1.73	1.58		
E-Mail	2.93	2.94	2.93		2.92	2.93		
Chat	1.48	1.42	1.53		1.54	1.37		
Entertainment	1.99	1.86	2.09	*	2.12	1.75	***	*
Online Games	1.43	1.23	1.55	***	1.53	1.25	*	
Research	2.64	2.66	2.63		2.61	2.66		
Download	2.20	2.27	2.16		2.37	1.87	***	
Online Banking	1.54	1.86	1.33	***	1.66	1.22	***	***
Online Trading	1.36	1.71	1.14	***	1.49	1.12	***	***
Browsing	2.19	2.01	2.31	**	2.36	1.81	***	
Newsgroups	1.49	1.46	1.51		1.55	1.37		
Work	1.79	2.05	1.61	***	1.87	1.64		
Other	1.87	1.96	1.82		1.93	1.73		

*p<.05, **p<.01, ***p<.001

Significant interaction effects make interpretation of main effects inappropriate for the entertainment, online banking and online trading items. US males used the Internet more than German males and German and American females (2.28 vs. 1.89, and 1.73, 1.76), causing the entertainment interaction. German males used the Internet more than German females, US females and US males for online trading (2.0 vs. 1.19, 1.06 & 1.15) and banking (2.11 vs. 1.23, 1.21 & 1.35), causing those significant interactions. In interpreting the main effects, Germans used the Internet more for shopping and work, while Americans used the Internet more for browsing and online games. Men used the Internet more than women for online games, downloading and browsing.

Survey participants were also asked what kind of products or services they had purchased on the Internet. Statistics were first calculated for the item “I do not purchase online”, and significant differences in home country and gender were found. Subjects that did not purchase online were then dropped from further analysis so as to not bias the overall results of how subjects paid for purchases. A MANOVA was conducted using the 14 remaining types of purchases as DVs and home country (Germany vs. US) and

gender as IVs. Multivariate Fs for home country ($F=11.096$, $p<.001$) gender ($F=2.001$, $p<.05$) were significant, so individual items were examined for these two independent variables. Table 3 lists the percentage of respondents that purchased each of the 15 types of goods or services, broken down by home country and gender.

Table 3. Results of MANOVA of Differences Between German and US and Male and Female Purchase Habits on the Internet.

	Total	German	US	Sig.	Male	Female	Sig.
	%	%	%	Dif.	%	%	Dif.
I do not purchase online	26	17	31	*	20	34	*
Software	17	22	12		20	10	
Computer Hardware	19	24	15		26	6	**
Electronics	13	21	6	*	17	4	*
Movies	17	10	21		22	6	*
Music	28	27	29		34	16	*
Books	48	69	32	***	51	42	
Computer Games	7	7	6		9	2	
Insurance	6	6	6		7	4	
Food	0	0	0		0	0	
Tickets	36	25	44		37	34	
Sporting Goods	16	10	20		23	2	**
Stocks	17	31	6	***	23	6	**
Securities	4	6	2		6	0	
Other	34	19	45	**	29	44	

* $p<.05$, ** $p<.01$, *** $p<.001$

In interpreting the main effects, Germans were more likely to purchase online, and the ones that did purchase online were more likely to purchase electronics, books and stocks, than Americans who purchased online. Females were more likely to answer they did not purchase online, and the ones that did were less likely than males to purchase computer hardware, electronics, movies, music, sporting goods and stocks.

As shown in Table 3, twenty-six percent of students indicated that they did not purchase over the Internet. It was expected that some survey participants would not have engaged in e-commerce, so both a structured question and an open-ended question inquiring about reasons for not buying on the Internet were included. The most frequent responses to the open-ended question included the lack of a credit card, security concerns, lack of time for shopping online, the difficulty of buying online and the difficulty of comparing goods or finding information on goods online.

Responses to the structured question about reasons for not buying over the Internet appear in Table 4. The percentage of participants that selected each of the seven options are listed by home country and gender. A MANOVA was conducted using the

seven reasons for not buying on the Internet as DVs and home country (Germany vs. US) and gender as IVs. Multivariate Fs for home country ($F=2.831$, $p<.01$) gender ($F=4.565$, $p<.001$) and the interaction of the two terms ($F=2.075$, $p<.05$) were significant, so individual items were examined for all three independent variables. Significant interaction effects make interpretation of main effects inappropriate for security concerns and delivery problems. For the interaction effects, both German females (67%) and US males (46%) give security concerns as a reason for not buying online at a higher rate than German males (37%) and US females (37%). For the other interaction effect, US females listed delivery problems as a reason for not buying over the Internet at a much higher rate than US males, German males and German females (65% vs. 30%, 20% & 20%). In interpreting the main effects, Americans selected the lack of money option more often than Germans, and Germans missed the shopping experience more than Americans. Females missed the shopping experience and the social experience of shopping more than males, while males were more likely to indicate that there was no reason that kept them from buying more than females.

Table 4. Results of MANOVA of Differences Between German and US Subjects and Male and Female Reasons for not Buying on the Internet.

	Total	German	US	Sig.	Male	Female	Sig.	Interaction
	%	%	%	Dif.	%	%	Dif.	Significant
None	21	22	20		26	12	**	
No Money	33	25	39	*	33	33		
Restricted Internet access	2	4	2		3	1		
Security Concerns	45	48	43		42	49		**
Shopping experience absent	33	47	24	***	24	49	***	
Social experience absent	13	17	11		7	24	***	
Delivery problems	21	20	21		26	12	*	*

* $p<.05$, ** $p<.01$, *** $p<.001$

Survey participants were also asked about paying for Internet purchases. About half (46% of US students, and 53% of German students, 49% overall) would have lower spending limits online than in a face-to-face purchase. Respondents were also asked to choose, from a list of nine options, how they pay for their Internet purchases. The percentages using each of the options to pay for goods or services are listed in Table 5.

Table 5. Results of MANOVA of Differences Between German and US Subjects and Male and Female Subjects in Paying for Internet Purchases.

	Total	German	US	German -US Sig.	Male	Female	M-F Sig.	Interaction Sig.
	%	%	%		%	%		
Credit Card	48	31	59	***	56	36	**	
Debit Card	15	5	22	***	18	11		*
Smart Card	1	0	2		0	3		
Check	7	10	6		8	7		**
C.O.D.	13	30	2	***	13	12		
Bill Me Later	19	37	7	***	19	19		
E-Cash	1	4	0	*	2	0		
Electronic Wallet	0	0	0		0	0		
Direct Debit Authorization	9	21	2	***	13	4	*	
Other	1	1	1		0	2		

* $p < .05$, ** $p < .01$, *** $p < .001$

A MANOVA was conducted using the nine payment methods as DVs and home country (Germany vs. US) and gender as IVs. Multivariate Fs for home country ($F=9.450$, $p < .001$) gender ($F=2.412$, $p < .01$) and the interaction of the two terms ($F=2.1982$, $p < .01$) were significant, allowing further investigation of individual items for all three independent variables. The significant interaction effect found for the use of Debit Cards makes interpretation of main effects inappropriate, but the interaction comes from the greater use of debit cards by US males (29%) versus German females (10%), German males (2%) and US females (11%). Similarly German females use checks more often than German males (17% to 6%), while US males use checks more than US females (9% to 0%). For main effects, Americans used credit cards more often than Germans, while Germans used C.O.D., direct debit authorization, e-cash and “bill me later” types of payment more often than Americans. Males also used credit cards and direct debit authorization more often than females.

Table 6. Results of MANOVA of Differences Between German and US Subjects' Comfort Level with Revealing Certain Information over the Internet.

	Total		German		US		Sig.
	Mean	S. D.	Mean	S. D.	Mean	S. D.	
Date of Birth	1.47	.70	1.64	.76	1.35	.63	**
Credit Card #	2.47	.70	2.67	.61	2.34	.73	***
Address	1.96	.79	2.10	.74	1.87	.81	*
Phone #	2.19	.80	2.46	.73	2.01	.80	***
ID/SS #	2.70	.57	2.68	.57	2.71	.57	

* $p < .05$, ** $p < .01$, *** $p < .001$

Respondent comfort with giving out personal information over the Internet was also assessed with a series of questions. The multivariate F for German vs. US students was significant ($F=8.37$, $p<.001$), but the F for gender and the interaction term failed to reach significant levels. Accordingly, only results for German and US students are interpreted. Scoring was on a scale with 1=comfortable, 2=neutral and 3=uncomfortable. Germans were less comfortable giving out all types of information except ID/SS#, where restriction of range may be evident. Several means suggest relative comfort revealing some types of information. Results appear in Table 6.

Finally, survey participants were asked how important certain brand and product characteristics were in making a decision to buy online. A MANOVA was conducted using the five characteristics as DVs and home country (Germany vs. US) and gender as IVs. Only the multivariate F for gender ($F=2.881$, $p<.05$) was significant, so only results for the males vs. females are reported in Table 7. Items were scored 1=unimportant to 3=important. Females responded that security was significantly more important in making a decision to buy online than males.

Table 7. Results of MANOVA on the Importance of each Characteristic in Making Decisions to Buy Online.

	Total		Male		Female		Sig.
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Dif.
Store Name	2.38	.68	2.36	.65	2.39	.73	
Low Price	2.76	.47	2.78	.46	2.73	.51	
Brand Name	2.47	.61	2.51	.57	2.39	.67	
Service	2.80	.44	2.76	.47	2.86	.39	
Security	2.83	.40	2.75	.45	2.96	.26	**

** $p<.01$ ** $p<.01$

IV. LIMITATIONS

As with any exploratory study, this one has a number of limitations. Several of these limitations revolve around the sample. First, although the snowball sampling procedure was intended to produce a sample of computer-savvy students similar to the student investigators, it also can introduce bias into the results of the survey. Since the sample is intentionally nonrandom, care must be taken in generalizing to the population. A second limitation of the sample is its size. Although sample sizes are adequate for the statistical techniques employed, extensive generalization could be problematic. In the discussion that follows, the researchers have been careful to interpret results without extensive generalization.

As with other studies where the literature is in an early stage of development, there is the risk that important variables are absent from analyses. Certainly, that risk

exists here. In addition, the rapid development of internet technology quickly adds hardware, services, products and techniques that are not included in any particular study. This study, for example, doesn't address the growing use of the internet where hand-held devices are used for e-commerce. This rapid development of e-commerce techniques, services and products also has implications for the timeliness of studies. The results of studies only a couple of years old can be misleading for readers interested in current results.

Finally, this study is limited in its international applicability. Based on virtually any measure of international cultural differences, a comparison consisting solely of US and German subjects lacks adequate coverage of cultural differences to provide true generalizability. Conclusions drawn should be carefully limited to the populations studied. Given the limitations listed above, the authors provide the following discussion of results.

V. DISCUSSION

The most common student uses of the Internet were for e-mail, research, and the university, all of which are possibly school-related. Survey participants also used the Internet for a broad range of e-commerce activities. In contrast to polls showing that 35% of US adults (Poll, 2000) and 63% of Germans age 14 to 64 plan to purchase online (Koecher, 2000), 74% of this sample already has purchased online. There are also gender and country differences in the kind of goods purchased. Some of the differences are understandable, such as the male predominance in purchasing sporting goods, computer hardware and electronics. Others are less predictable, such as the higher levels of German purchases of electronics books and stocks. The high level of "other" responses for US participants suggests that the list of items was not comprehensive. Future studies should examine other items as well. Overall, these results are consistent with findings that foreign consumers embrace e-commerce at a higher rate than US consumers (Foreign Consumers, 2000), while disagreeing with other studies suggesting a higher US adoption rate (Bellman et al. 1999).

Interestingly, in a significant interaction effect, both German females (67%) and US males (46%) give security concerns as a reason for not buying online at a higher rate than German males and US females (both 37%). When asked about important characteristics in making decisions to buy online however, only the main effect of a higher female response was significant. Perhaps the gap between these two results reflects the difference between the cognitive recognition of a potential problem and the behavioral action that may result from it. Regardless, security concerns were the highest rated reason for not buying online, consistent with the results of Scribbins

(2001) and a CommerceNet study (2000) ranking security as number one of the top ten global business-to-consumer barriers.

In paying for purchases, overall the credit card predominates. It is not surprising though, that Americans use a credit card more often than Germans or that Germans use direct debit authorization, C.O.D. or “bill me later” forms of payment more than Americans. Few survey respondents reported using e-cash or an electronic wallet, however, leading to doubts about the market penetration of these items. The small percentage indicating they used other means of payment suggests that this list is comprehensive for this sample.

Research in e-commerce practices is in its infancy. Studies such as this one provide a baseline of expectations on which to build future research. The subjects in this study are future long-term e-commerce participants, and not strictly a representative sample of current e-commerce users. They do, however, provide a view of the future of e-commerce as they enter their peak earning and spending years. They also provide a baseline of user habits to compare non-users against to help determine how to best spread the user base of e-commerce.

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