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### DOES MASS MEDIA FUEL, AND EASY CREDIT FACILITATE, IMPULSE BUYS?

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**ABSTRACT:** This paper studies whether exposure to mass media and liking advertising are associated with an increased impulse buy tendency, and whether the availability of a credit card acts as a facilitating stimulus. It is found that impulse buys are positively associated with exposure to commercial television, but not to other forms of mass media. For females, liking advertising in general is positively associated with impulse buying; for males, having a preference for informative advertising is negatively associated with impulse buying. For both, credit card use facilitates the behavior. Besides being robust and statistically significant, these effects are qualitatively quite large.

**Keywords:** buying behavior; impulsiveness; mass media; advertising; credit cards.

**JEL codes:** D12, E21, G21, L82, M37.

# Does Mass Media Fuel, and Easy Credit Facilitate, Impulse Buys?

## 1. INTRODUCTION

Do exposure to mass media and a liking for advertising encourage impulse buys? Is this (possibly) increased tendency facilitated by the availability of a convenient form of debt financing in the form of a credit card? This paper studies these issues with a representative random sample of the Finnish adult population by using multivariate regression methods.

For the purposes of this paper an impulse buy is defined as "... the discretionary purchase of goods and services by consumers without prior planning or explicit buying intentions." (Wood, 2005: 279). Such a buy is possibly but not necessarily followed by a feeling of regret or a perception that one's self-control failed (Baumeister, 2002). Further consideration would have lead one to study other alternatives and possibly forgo the transaction, to settle for another offering or bundle of features, and/or to bargain or search for a lower price. An extreme form of impulse buying may be defined as being compulsive.

Impulse buying is among the key forces in retail trade: in developed countries roughly from one quarter to half of all consumer purchases may be considered impulse buys. In their pre- and post-interviews of US mall shoppers Beatty and Ferrell (1998: 178) find that 29% of purchases "... could potentially be classified as impulsive." Nicholls et al. (2001) observe that nearly half of US mall shoppers made unplanned purchases; their Chilean counterparts were less spontaneous. Rook and Fisher (1995) find that 38% of US retail customers are self-defined impulse buyers. Scherhorn, Reisch, and Raab (1990) suggest that one fourth of German adults have some tendency to buy on impulse. Coley and Burgess (2003) find that females and males differ in their affective and cognitive processes of impulse buying; virtually all studies focusing on gender find that females are on average more impulsive buyers. Bellenger, Robertson, and Hirschman (1978) were among the first to suggest that impulse buying varies by product category (Jones et al., 2003). Upon comparing shopping lists and actual purchases, Block and Morwitz (1999) observe that 60% of the items ultimately purchased are not recorded by consumers. While the figures provided here are not directly comparable, the considerable economic importance of impulse buys is well-established; furthermore, it seems that at least some forms of impulse buying are on the increase (Neuner et al., 2005).

Today's mass media promotes a lifestyle that is more bountiful and lavish than that of a typical viewer. Furthermore, according to ZenithOptimedia (2006), in 2005 over \$400 billion was spent globally on (mostly non-informative) advertising in the major media; a not insignificant part of this was specifically geared towards influencing viewers' tendency to buy on impulse. Against this background there is surprisingly little academic research on the relationship of mass media or advertising and impulse buying, especially since customer loyalty programs, online accounts, electronic payments, and (soon universal) mobile connectivity offer new ways to tailor messages based on the individu-

als' characteristics and physical location as well as the time and situation s/he is in at that very moment.

The literature on mass media and impulse buys has largely focused on television, although, for example, Adelaar et al. (2003), Madhavaram and Laverie (2004), as well as Zhang et al. (2006) focus on online media. In the literature it is proposed that viewers adopt the materialistic values and sentiments promoted by TV advertising and programming. O'Guinn and Shrum (1997: 291) argue that "... television programming is a significant, yet overlooked, source of consumption-related social perceptions." Scherhorn et al. (1990) suggest that TV advertising encourages impulse buying in the German context. Kwak et al. (2002) find that exposure to TV commercials and shows invokes compulsive buys in Korea but not (necessarily) in the US. The explanations offered for this somewhat surprising finding are that in the US attitudes towards advertising may be more stable (i.e., they may vary less with the amount of exposure); that US consumers may be more skeptical towards advertising; and that with TV exposure Korean consumers may adopt more consumption-centric US values.

Hirschman (1979) suggests that, as credit cards and other payment options differ in their economic and social characteristics, having a credit card available may influence consumer behavior. Feinberg (1986) performs four experiments and finds that the presence of credit card cues increases the probability, speed, and magnitude of spending. Thus, credit card use may be considered a facilitating stimulus. It should also be pointed out that for certain kinds of non-store purchases—for example catalog, online, and TV shopping—having a credit card may be a prerequisite for impulse buys. Roberts and Jones (2001) find that credit card use encourages excessive spending among US college students. Ritzer (1995) found that the acceptance of credit cards resulted in larger and more frequent transactions in fast-food restaurants. O'Guinn and Faber (1989) show that compulsive buyers tend to have more credit cards; based on d'Atous (1990) and Magee (1994) it also seems that they are more likely to use them. On the other hand, Deshpandé and Krishnan (1980) find no evidence of credit cards feeding impulse buys.

This paper studies mass media exposure, a liking for advertising, and credit card use that, to the best of our knowledge, have not been studied *together* in the previous literature. We employ a rigorous econometric framework to fully exploit the data at hand. Section 2 describes the data. The results of our analysis are reported in Section 3. Section 4 concludes. To anticipate our conclusions, we find that exposure to commercial television, but not to other forms of mass media, is associated with the tendency to buy on impulse for both genders. For females, liking advertising in general is positively, and, for males, having a preference for informative advertising is negatively associated with the tendency to buy on impulse. For both genders, frequent credit card use facilitates the behavior; the effect seems to be qualitatively larger for females, but the gender difference is not statistically significant. Besides being robust and statistically significant, these effects are also qualitatively quite large.

## 2. DATA

The data used in this study is collected by Pool Media International Oy (Helsinki, Finland) for the purposes of defining marketing segments and related advertising strategies. It is the Finnish incarnation of the Universal McCann's proprietary global quanti-

tative and qualitative consumer behavior study “Media in Mind” (see <http://www.UniversalMcCann.com> and, e.g., Bowes, 2000; Snyder, 1999). The employed representative simple random sample of the Finnish population is defined with the assistance of the Population Register Centre in Finland. The data comprises a survey of several hundred items as well as a diary in which the respondents have chosen one week and one weekend day to record their activities in half-hour intervals (in one-hour intervals from 23:00 to 05:00).

To guarantee the validity of the results, this analysis focuses on economically active individuals presumably having sufficient financial and psychological independence to act on their desires, needs, and urges. Thus, the 18–65-year old household heads (i.e., the main income earners or providers regardless of gender) and their partners (if present) are chosen for analysis. As the previous literature suggests that there may be considerable gender differences in the affective and cognitive processes of impulse buying, females and males are considered separately. With these restrictions, of the original sample of 1,063 individuals, 506 females and 344 males are left for analysis.

Table 1 describes the variables. The data has no particular focus on impulse buying, but it nevertheless includes two suitable proxies for it. As can be seen in the top section of table 1, *Impulse buy 1* is defined as agreement with the statement (on a 5-point Likert scale) that “I frequently make purchases without thinking whether or not they make economic sense”. Similarly *Impulse buy 2* refers to agreement with the statement “I often buy things I really cannot afford”. While a more sophisticated measurement of impulse buying (Faber and O’Guinn, 1992; Youn and Faber, 2002) would be desirable, our analysis does not explicitly depend on it. As long as the proxies have appropriate (partial) correlations with the factors influencing impulse buys, the possible findings remain valid, even though the stochastic error term might be inflated. Any problems in the measurement of the dependent variable will thus bias us against finding the effects. Thanks to the diary information, average daily exposures to various types of mass media can be calculated quite accurately (table 1, the second section from the top). As public broadcasting (<http://www.yle.fi/fbc/>) has a fairly strong foothold in Finland, the commercial and non-commercial radio and TV exposures are considered separately. The third section defines two variables indicating the respondents’ attitudes towards advertising. *Prefers informative advertising* is based on its ranking among seven desirable properties of TV commercials. *Likes advertising* is based on a 21 item scale (standard normal; Cronbach’s alpha or the scale reliability coefficient is .81). The fourth section defines a set of standard control variables; as the effect of age might be non-linear, its square term is also included. The fifth section defines basic controls of the geographical location. The section at the bottom of table 1 lists the controls for personality traits. They are based on a principle component analysis of the correlation matrix of Rokeach’s (1973; 1979) eighteen item scale (rankings of the survey instrumental values); the six components with eigenvalues above one are retained.

**Table 1. Variable definitions.**

<i>Impulse buy 1</i>	Impulsive buying tendency. Agreement with the statement "I frequently make purchases without thinking whether or not they make economic sense" (5-point Likert).
<i>Impulse buy 2</i>	Impulsive buying tendency. Agreement with the statement "I often buy things I really cannot afford" (5-point Likert).
<i>Commercial TV</i>	Average daily exposure to commercial television (hours).
<i>Non-comm. TV</i>	Average daily exposure to non-commercial television (hours).
<i>Comm. radio</i>	Average daily exposure to commercial radio (hours).
<i>Non-c. radio</i>	Average daily exposure to non-commercial radio (hours).
<i>Newspapers</i>	Average daily time spent reading newspapers (hours).
<i>Magazines</i>	Average daily time spent reading magazines and periodicals (hours).
<i>Prefers infor. adv.</i>	Prefers informative advertising. The (reversed and normalized) importance ranking of the provision of information among 7 properties of TV commercials (from 0 to 1 on 1/7 intervals).
<i>Likes advertising</i>	Has a liking for or interest in advertising. Based on 21 item scale combined using Cronbach's alpha method (standard normal; the scale reliability coefficient is .81).
<i>No. of credit cards</i>	Number of credit cards the person currently has (count).
<i>Freq. card user</i>	The person uses a credit card frequently, that is, daily or almost daily (dummy).
<i>Age</i>	The age of the person at the time of survey (years).
<i>Age squared</i>	The age of the person squared (square per 1,000).
<i>Degree</i>	The person holds a vocational, professional or university degree (dummy).
<i>Married</i>	The person is married (dummy).
<i>Kids</i>	Number of children under the age of 16 (count, truncated: 3 or more recorded as 3).
<i>Job</i>	Works currently (dummy).
<i>Job, managerial</i>	Works, holds a managerial position (dummy).
<i>Job, short hours</i>	Works 20 or fewer hours a week (dummy; reference: those working 21 to 40 hours).
<i>Job, long hours</i>	Works over 40 hours a week (dummy; reference: those working 21 to 40 hours).
<i>Income, low</i>	Monthly income under €1,300 (dummy; reference: income from €1,700 to €1,900).
<i>Income, med. low</i>	Monthly income from €1,300 to €1,700 (dummy; reference: income from €1,700 to €1,900).
<i>Income, med. high</i>	Monthly income from €1,900 to €2,700 (dummy; reference: income from €1,700 to €1,900).
<i>Income, high</i>	Monthly income over €2,700 (dummy; reference: income from €1,700 to €1,900).
<i>Urban location</i>	Lives in a (moderately) large city (dummy).
<i>Region, north</i>	Located in northern Finland (dummy; reference: south).
<i>Region, east</i>	Located in eastern Finland (dummy; reference: south).
<i>Region, west</i>	Located in western Finland (dummy; reference: south).
<i>Trait, self-esteem</i>	The first component retained: high positive loadings on intellectual, capable, and ambitious; high negative loadings on forgiving, loving, and polite (standard normal).
<i>Trait, artistic</i>	The second component retained: high positive loadings on broadminded and imaginative; high negative loadings on obedient (standard normal).
<i>Trait, tidy</i>	The third component retained : high positive loadings on clean, cheerful, and ambitious; high negative loading on independent and responsible (standard normal).
<i>Trait, joyful</i>	The fourth component retained: high positive loading on cheerful; high negative loadings on courageous, honest, and helpful (standard normal)
<i>Trait, social</i>	The fifth component retained: high positive loadings on helpful, intellectual, and logical; high negative loading on independent (standard normal).
<i>Trait, liberal</i>	The sixth component retained: high positive loading on broadminded; high negative loadings on honest and loving (standard normal).

As the top section of table 2 suggests, some one quarter of both females and males may be considered impulse buyers (i.e., they agree with the question used to derive the primary dependent variable), although at about 6% the share of the highest impulse buy category is twice as high among females as it is among males. The secondary measure (the bottom section) sets the share of impulse buyers (and, in this case, also excessive spenders; note that we do control for income in all the regressions below) at about 13% for females and 10% for males.

**Table 2. Distributions of impulse buying tendencies.**

Primary question: <i>I frequently make purchases without thinking whether or not they make economic sense...</i>									
Female (506 obs.)					Male (344 obs.)				
Strongly disagree	...		Strongly agree		Strongly disagree	...		Strongly agree	
1	2	3	4	5	1	2	3	4	5
16.40%	44.07%	12.65%	20.95%	5.93%	18.02%	41.57%	14.53%	22.97%	2.91%

Secondary question: <i>I often buy things I really cannot afford...</i>									
Female (499 obs.)					Male (338 obs.)				
Strongly disagree	...		Strongly agree		Strongly disagree	...		Strongly agree	
1	2	3	4	5	1	2	3	4	5
34.67%	43.89%	8.02%	11.02%	2.40%	34.62%	45.27%	10.36%	7.10%	2.66%

Table 3 presents descriptive statistics by gender. The average daily exposure of females to commercial TV is a little over one hour and fifty minutes, and that of males about four minutes less. As for non-commercial TV (with programming emphasizing—besides entertainment and sports—current affairs, news, and politics), males are exposed for nearly two and a half hours, and females over fifty minutes less—the difference is statistically significant at 1% level (as for all tests reported in this section, we employ a two-sided t-test without assuming equal variances across genders). Males listen more to non-commercial radio than females (significant at 1% level). Males spend more time on newspapers (significant at 1% level), and females on magazines and periodicals (significant at 5% level). Preference for informative advertising is reasonably strong among both genders. Females have a slightly higher liking for advertising in general than males. Females have on average .6 credit cards whereas males have on average .7 credit cards—the difference is statistically significant at 5% level. Roughly one fifth of both females and males are daily credit card users.

Briefly on the control variables: the average age of the individuals in the sample is 42 years (calculated over both genders); two thirds have a vocational, professional, or university degree; more than half are married; one third has at least one child (not shown; the table refers to the truncated count as discussed above); three fourths are currently working; about one in ten holds a managerial position; 4% work 20 or fewer hours a week and 18% work over 40; 15% belong to the lowest and 29% to the highest of the five income brackets; somewhat less than half of the individuals live in urban (as opposed to suburban or rural) locations; more than half of the individuals live in southern Finland (the reference group in regressions; not shown). As for the personality traits, females have lower self-esteem (significant at 1% level), are more artistic (significant at 1% level) and liberal (significant at 10% level) as well as less social (significant at 5% level). The references to the gender differences in the personality traits should not be taken as general statements but rather simply statistical differences among the variables as they are defined and labeled here.

**Table 3. Descriptive statistics by gender.**

	Female (506 observations)				Male (344 observations)			
	M	SD	Min.	Max.	M	SD	Min.	Max.
<i>Commercial TV</i>	1.848	1.645	0	10.286	1.786	1.666	0	11.071
<i>Non-comm. TV</i>	1.554	1.429	0	8.214	2.469	2.646	0	22.857
<i>Comm. radio</i>	1.114	2.049	0	18.143	1.171	1.989	0	9.643
<i>Non-c. radio</i>	.781	1.680	0	13.429	1.217	2.397	0	15.571
<i>Newspapers</i>	.773	.627	0	3.857	.962	1.065	0	10.500
<i>Magazines</i>	.315	.516	0	3.929	.239	.514	0	5.500
<i>Prefers infor. adv.</i>	.588	.283	0	1	.593	.296	0	1
<i>Likes advertising</i>	.011	.972	-2.886	2.752	-.016	1.041	-2.948	3.203
<i>No. of credit cards</i>	.579	.638	0	4	.735	.730	0	3
<i>Freq. card user</i>	.196	.397	0	1	.235	.425	0	1
<i>Age</i>	42.123	12.117	18	65	43.570	11.824	19	65
<i>Age squared</i>	1.921	1.052	.324	4.225	2.038	1.048	.361	4.225
<i>Degree</i>	.704	.457	0	1	.625	.485	0	1
<i>Married</i>	.510	.500	0	1	.581	.494	0	1
<i>Kids</i>	.676	.972	0	3	.544	.934	0	3
<i>Job</i>	.702	.458	0	1	.750	.434	0	1
<i>Job, managerial</i>	.087	.282	0	1	.151	.359	0	1
<i>Job, short hours</i>	.040	.195	0	1	.041	.198	0	1
<i>Job, long hours</i>	.130	.337	0	1	.244	.430	0	1
<i>Income, low</i>	.160	.367	0	1	.137	.344	0	1
<i>Income, med. low</i>	.174	.379	0	1	.113	.318	0	1
<i>Income, med. High</i>	.247	.432	0	1	.317	.466	0	1
<i>Income, high</i>	.261	.440	0	1	.323	.468	0	1
<i>Urban location</i>	.455	.498	0	1	.485	.501	0	1
<i>Region, north</i>	.045	.209	0	1	.047	.211	0	1
<i>Region, east</i>	.115	.319	0	1	.157	.364	0	1
<i>Region, west</i>	.273	.446	0	1	.256	.437	0	1
<i>Trait, self-esteem</i>	-.134	.927	-2.073	2.442	.197	.938	-1.944	2.783
<i>Trait, artistic</i>	.082	.986	-2.311	2.388	-.120	.869	-2.307	2.191
<i>Trait, tidy</i>	.020	.960	-2.419	3.161	-.029	.923	-2.252	3.097
<i>Trait, joyful</i>	-.018	.922	-2.190	3.041	.027	.978	-2.742	2.541
<i>Trait, social</i>	-.053	.939	-2.948	2.851	.078	.949	-3.120	2.474
<i>Trait, liberal</i>	.049	.921	-2.559	4.151	-.073	.976	-2.675	3.308

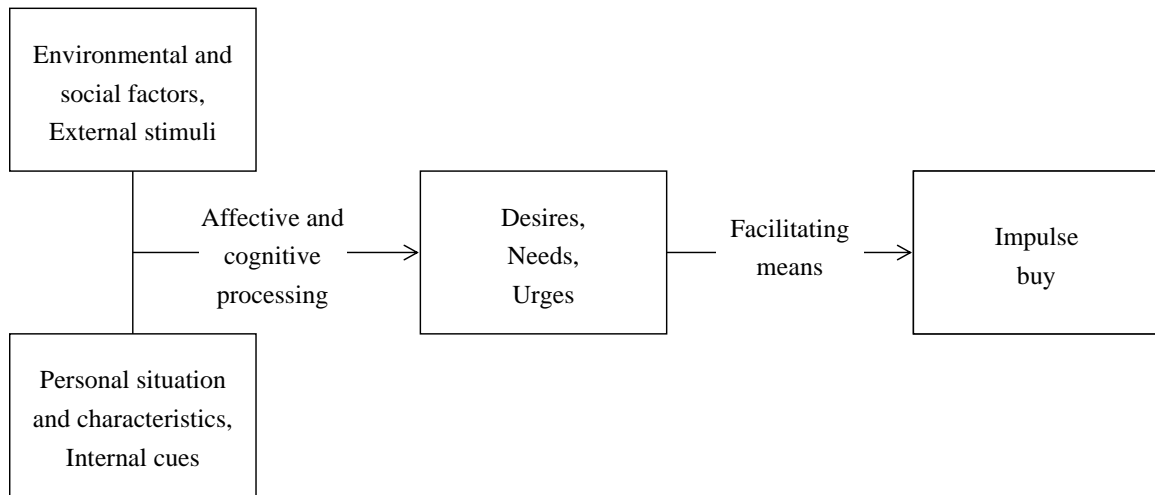
### 3. ANALYSIS

As noted in the introduction, an impulse buy is defined as "... the discretionary purchase of goods and services by consumers without prior planning or explicit buying intentions." (Wood, 2005: 279). It is, at least to an extent, unplanned and/or spontaneous, as well as in some aspects unnecessarily and/or irrational. Bayley and Nancarrow (1998) discuss the fine points of the concept (Rook, 1987; Rook and Fisher, 1995; Stern, 1962). Impulse buying may be considered a weaker form of the perhaps more studied compulsive buying (Dittmar, 2005; Hirschman, 1992; O'Guinn and Faber, 1989). We neither make a distinction between spontaneous and impulsive (Solomon, 2003) nor between partially planned or impulsive (Cobb and Hoyer, 1986).



The underlying ideas of the empirical model estimated in this paper are captured in the theoretical model presented in figure 1 (inspired by Youn and Faber, 2000). Through affective and cognitive processing both external stimuli and internal cues affect one's desires, needs, and urges which—if accompanied by suitable facilitating means—may lead to an impulse buy.

**Figure 1. The stylized model.**



A reduced-form equation of the model in figure 1 is estimated. Given the nature of the dependent variable, the ordered logit is a natural candidate for an estimator to be employed in the analysis; it does not make assumptions on the distance between the five possible categories of (dis)agreeing with the above two statements but exploits the fact that they are ordinal.

Table 4 presents the baseline regression results of an ordered logit model with White (1980) heteroskedasticity consistent standard errors.

**Table 4. The ordered logit regression results.**

	Female		Male	
	<i>Impulse buy 1</i>	<i>Impulse buy 2</i>	<i>Impulse buy 1</i>	<i>Impulse buy 2</i>
<i>Commercial TV</i>	.113 *	.120 ***	.105 ""	.197 ***
<i>Non-comm. TV</i>	.036	-.062	.015	.031
<i>Comm. radio</i>	.003	.015	.031	-.026
<i>Non-c. radio</i>	-.040	-.027	.011	.019
<i>Newspapers</i>	.006	-.193	-.062	-.270 **
<i>Magazines</i>	-.116	.256 ""	-.189	-.223
<i>Prefers infor. adv.</i>	-.178	-.461 "	-.645 ""	-.601 ""
<i>Likes advertising</i>	.258 ***	.152 "	.143 '	.025
<i>No. of credit cards</i>	-.002	.183	.137	-.152
<i>Freq. card user</i>	.665 **	.716 ***	.463 ""	1.014 ***
<i>Age</i>	.036	.011	-.059	.031
<i>Age squared</i>	-.593	-.277	.255	-.597
<i>Degree</i>	-.018	-.018	-.164	.114
<i>Married</i>	-.284 "	-.264	.041	.066
<i>Kids</i>	.075	.114 '	-.232 *	.017
<i>Job</i>	.191	-.030	-.312	-.364
<i>Job, managerial</i>	.466 "	-.162	.298	.179
<i>Job, short hours</i>	-.257	.189	.166	.049
<i>Job, long hours</i>	-.119	-.142	-.401 ""	-.292
<i>Income, low</i>	.102	.307	.484	.313
<i>Income, med. low</i>	-.247	-.068	-.344	-.017
<i>Income, med. high</i>	-.002	-.193	.291	-.324
<i>Income, high</i>	-.281	-.181	.467 '	-.470
<i>Urban location</i>	.159	.253 '	-.323 "	-.244
<i>Region, north</i>	.516	.659 "	-.434	-.829 ""
<i>Region, east</i>	-.447 *	-.089	-.432 "	-.232
<i>Region, west</i>	-.170	.046	-.005	-.018
<i>Trait, self-esteem</i>	-.122 '	-.086	-.283 **	-.114
<i>Trait, artistic</i>	.262 ***	.245 **	.448 ***	.349 ***
<i>Trait, tidy</i>	.131 '	.186 *	.056	.149
<i>Trait, joyful</i>	-.121 "	-.074	-.028	.067
<i>Trait, social</i>	-.108	.013	.055	.109
<i>Trait, liberal</i>	.009	.040	.117	.110
<i>Constant, cut 1</i>	-1.196	-0.726	-4.326 **	-1.417
<i>Constant, cut 2</i>	1.082	1.455	-2.211 '	0.89
<i>Constant, cut 3</i>	1.718 "	2.062 "	-1.467	1.825
<i>Constant, cut 4</i>	3.61 ***	3.965 ***	1.162	3.266 *
Observations	506	499	344	338
McKelvey and Zavoina's $R^2$	0.152	0.156	0.163	0.184

Notes: Estimated with Stata 9.2 SE for Windows—a program used to derive these and all other results is available upon request. White (1980) heteroskedasticity consistent standard errors. The reported coefficients are ordered log-odds for a one unit increase in the regressor while holding the others constant. \*\*\*, \*\*, \*, "", "", and ' respectively indicate statistical significance at 1, 5, 10, 15, 20, and 25% levels. Windmeijer (1995) suggests that for ordinal outcomes McKelvey and Zavoina's  $R^2$  most closely approximates the linear regression's  $R^2$  on the underlying latent variable.

The coefficients reported in Table 4 are ordered log-odds for a one unit increase in the regressor while the other variables in the model are held constant. As can be seen, the tendency for impulse buys is positively associated with the exposure to commercial

television (*Commercial TV*) for both genders and both dependent variables. Qualitatively the effect is quite large: if the subject were to increase her/his average daily exposure to commercial television by one hour, the log-odd of being in a higher impulse buy category would increase by 10 to 20%. Other mass media exposure does not seem to play a similar role. The coefficients on the advertising variables, while not consistently statistically significant, seem to suggest that a preference for informative advertising is associated with lower and a liking for advertising in general with higher impulse buying tendencies. There is a strong indication that impulse buyers are also frequent credit card users, although the tendency does not seem to be associated with the number of cards owned. Even though many previous studies suggest that age is an important explanatory factor of impulse buying behavior, from the outset the results in do not seem to support that. Note, however, that the regressions include both age and its square (in order to capture possible non-linearity), in which case their statistical significance should be tested jointly. A Wald-test of the joint significance indeed suggests that the two terms are highly statistically significant (at 1% level) in column 3; with the exception of column 2 there is some indication of statistical significance in the other cases. With the exception of some personality traits, the other control variables do not seem to have a consistent effect on the tendency to buy on impulse. Table 4 shows that the results are reasonably robust to the alternative specification of the dependent variable (*Impulse buy 2*). Thus, in the interest of space, only the primary dependent variable (*Impulse buy 1*) is considered in further analysis.

As some of the (non-)findings above may be driven by collinearity among the independent variables, the above model is re-estimated by including each of the variables of interest from *Commercial TV* to *Freq. card user* one at the time while otherwise maintaining the setup intact. As can be seen in table 5, the results change relatively little, although the advertising—and especially the credit card—measures seem to have a stronger association with impulse buying tendencies. It seems that the two credit card measures largely convey the same information, although being a frequent credit card user does so more accurately.

By forcing a single equation over all levels of the dependent variable, the standard ordered logit estimator maintains the proportional odds assumption. The performed likelihood ratio and Brant tests suggest, however, that this assumption may be violated here (as some of the independent variables cannot be retained in all of the implied binary logit regressions of males, the Brant test cannot be calculated in this case). Details of the Brant test suggest that being a frequent credit card user and the artistic personality trait are the most problematic independent variables in this respect (some other variables are also problematic; as they are not statistically significant, however, they are not considered here). The generalized ordered logit estimator (Williams, 2006) is used to relax the proportional odds assumption for the two variables. The results in table 6 suggest that being a frequent credit card user increases the probability of being in a higher impulse buy category more at the ends and less at the middle of the scale. The artistic personality trait (not shown) is especially strongly associated with not being at the low end of the impulse buy scale.

**Table 5. The ordered logit results: The variables of interest included one-by-one.**

Female, <i>Impulse buy 1</i> , 506 obs.				
<i>Commercial TV</i>	.130 **			
<i>Non-comm. TV</i>	.012			
<i>Comm. radio</i>	.017			
<i>Non-c. radio</i>		-.056		
<i>Newspapers</i>			-.067	
<i>Magazines</i>				-.079
<i>Prefers infor. adv.</i>				-.285
<i>Likes advertising</i>				.283 ***
<i>No. of credit cards</i>				.253 *
<i>Freq. card user</i>				.684 ***
Also including the following as regressors: <i>Age; Age squared; Degree; Married; Kids; Job; Job, managerial; Job, short hours; Job, long hours; Income, low; Income, med. low; Income, med. high; Income, high; Urban location; Region, north; Region, east; Region, west; Trait, self-esteem; Trait, artistic; Trait, tidy; Trait, joyful; Trait, social; Trait, liberal; Constants, cuts 1, 2, 3, and 4.</i>				
Male, <i>Impulse buy 1</i> , 344 obs.				
<i>Commercial TV</i>	.106 ""			
<i>Non-comm. TV</i>	.006			
<i>Comm. radio</i>	.053			
<i>Non-c. radio</i>		.001		
<i>Newspapers</i>			-.044	
<i>Magazines</i>				-.093
<i>Prefers infor. adv.</i>				-.708 *
<i>Likes advertising</i>				.194 *
<i>No. of credit cards</i>				.236 ""
<i>Freq. card user</i>				.547 *
Also including the following as regressors: <i>Age; Age squared; Degree; Married; Kids; Job; Job, managerial; Job, short hours; Job, long hours; Income, low; Income, med. low; Income, med. high; Income, high; Urban location; Region, north; Region, east; Region, west; Trait, self-esteem; Trait, artistic; Trait, tidy; Trait, joyful; Trait, social; Trait, liberal; Constants, cuts 1, 2, 3, and 4.</i>				

Note: See notes attached to table 4. Complete results available upon request.

**Table 6. The generalized ordered logit regression results.**

	Female, <i>Impulse buy 1</i> , 506 obs.	Male, <i>Impulse buy 1</i> , 344 obs.
<i>Freq. card user</i> : 1 vs. 2–5	1.181 ***	.577 "
<i>Freq. card user</i> : 1–2 vs. 3–5	.272	.241
<i>Freq. card user</i> : 1–3 vs. 4–5	.738 **	.597 *
<i>Freq. card user</i> : 1–4 vs. 5	1.079 **	.889 '

Also including the following as regressors: The proportional odds assumption maintained for *Commercial TV; Non-comm. TV; Comm. radio; Non-c. radio; Newspapers; Magazines; Prefers infor. adv.; Likes advertising; No. of credit cards; Age; Age squared; Degree; Married; Kids; Job; Job, managerial; Job, short hours; Job, long hours; Income, low; Income, med. low; Income, med. high; Income, high; Urban location; Region, north; Region, east; Region, west; Trait, self-esteem; Trait, tidy; Trait, joyful; Trait, social; Trait, liberal; Constants, cuts 1, 2, 3, and 4.* The prop. odds assumption not maintained for *Trait, artistic.*

Note: See notes attached to table 4. Complete results available upon request.

As is sometimes the case in regression analysis, it is possible that a few extreme observations drive the findings. As there is no established way to deal with the issue of con-

cern in the current context, two alternatives to address it are considered both separately and jointly. In columns 1 and 4 of table 7 independent variables are winsorized (Barnett and Lewis, 1994), that is, the extreme values are collapsed towards to mean (variables measured in hours: the top 1% of observations collapsed to the 99th percentile value of the variable in question; standard normal variables: the values more than two standard deviations away from the mean collapsed to  $\pm 2$ ). Columns 2 and 5 employ—as suggested by Hosmer and Lemeshow (2000)—the standardized Pearson residuals of the binary regressions implicit in the ordered logit to identify and eliminate outliers (the observations with an error more than four standard deviations away from the mean in any of the four binary logit regressions are considered to be outliers; with normally distributed errors this would be roughly equivalent to eliminating three out of every 100,000 observations). On the bases of studying the residuals 14 female (2.77%) and 9 male (2.61%) observations are considered outliers and thus dropped in the regressions. Columns 3 and 6 use both the winsorized variables and drop the identified outliers. As can be seen, performing outlier-robust regressions and/or eliminating outliers somewhat strengthens the already discussed results.

**Table 7. The outlier-robust ordered logit regression results.**

	Female, <i>Impulse buy 1</i>			Male, <i>Impulse buy 1</i>		
	(1) Winsorized	(2) W/o outliers	(3) Wins., w/o outl.	(4) Winsorized	(5) W/o outliers	(6) Wins., w/o outl.
<i>Commercial TV</i>	.125 **	.126 **	.139 **	.107 "	.142 *	.150 *
<i>Non-comm. TV</i>	.031	.037	.031	-.023	.001	-.047
<i>Comm. radio</i>	-.019	.004	-.019	.028	.029	.024
<i>Non-c. radio</i>	-.053	-.032	-.045	-.005	.010	-.007
<i>Newspapers</i>	.019	-.017	-.002	.050	-.067	.036
<i>Magazines</i>	-.084	-.179	-.150	-.061	-.212	-.109
<i>Prefers infor. adv.</i>	-.188	-.209	-.219	-.653 *	-.711 *	-.717 *
<i>Likes advertising</i>	.263 ***	.250 **	.254 **	.123	.155 '	.136
<i>No. of credit cards</i>	.004	-.029	-.023	.142	.136	.143
<i>Freq. card user</i>	.657 **	.660 **	.652 **	.441 ""	.471 ""	.457 ""
<i>Observations</i>	506	492	492	344	335	335

Also including the following as regressors: *Age; Age squared; Degree; Married; Kids; Job; Job, managerial; Job, short hours; Job, long hours; Income, low; Income, med. low; Income, med. high; Income, high; Urban location; Region, north; Region, east; Region, west; Trait, self-esteem; Trait, artistic; Trait, tidy; Trait, joyful; Trait, social; Trait, liberal; Constants, cuts 1, 2, 3, and 4.*

Note: See notes attached to table 4. Complete results available upon request.

#### 4. CONCLUSIONS

The data at hand suggest that some one fourth of the Finnish adult population may be considered impulse buyers, that is, roughly the same proportion as, for example, in Germany (Scherhorn et al., 1990) and in the United States (Beatty and Ferrell, 1998). Also in other respects both the data and the results derived resemble those in the (geographically diverse) previous literature, suggesting that our implications may be generalizable to developed countries at large. The prevalence of the impulse buying behavior

makes it important for manufacturers, distributors, and retailers of consumer goods and services to understand what drives and facilitates it.

Our core finding is that the tendency to buy on impulse is positively related to a high exposure to commercial television as well as liking (non-informative) advertising. Frequent credit card use seems to be a facilitating stimulus for the behavior. Besides being statistically significant, these effects are qualitatively quite large.

It is interesting to note that impulse buying does not seem to be affected by television viewing per se: despite considerable similarities in programming, only the commercial—and not the public (with no advertising of any kind)—television exposure is associated with impulse buying. Other forms of mass media—radio, newspapers, as well as magazines and periodicals—do not seem to be associated with impulse buying. As far as impulse buying and the exposure to commercial television is concerned, there seems to be no significant differences across genders.

In the context of advertising preferences, however, gender differences emerge. Females' impulse buying tendencies are positively and strongly associated with liking advertising in general; there is some indication of a similar, albeit weaker, effect in the case of males. Males' impulse buying tendencies are, however, negatively and quite strongly associated with having a preference for informative advertising; an effect that is not to be found in the case of females.

Both the number of credit cards owned and being a frequent credit card user are studied as indicators of having a convenient form of debt financing available. It seems that the two in fact convey largely similar information, although the latter is to be preferred empirically. Our findings suggest that a credit card is indeed an important facilitating stimulus for impulse buys for both genders; while the effect seems to be persistently somewhat higher for females, the gender difference is not statistically significant at conventional levels.

As for the considerable number of other variables included as controls in our analysis—some of which have been relatively widely discussed in the previous literature—, with the possible exception of some personality traits they do not seem to have a consistent and robust association with impulse buy tendencies in the context of our multivariate analysis.

In light of our evidence, the over \$400 billion spent globally on (mostly non-informative) advertising, and particularly the nearly \$150 billion spent on TV commercials (ZenithOptimedia, 2006), may be money well spent, at least in the sense that it is fueling viewers' impulse buy tendencies and thus generating sales. Our findings may provide some hints for manufacturers, distributors, and retailers in optimizing their promotional efforts. In this paper we have neither considered the welfare implications of impulse buying and efforts to promote it, nor advanced the underlying theories, although both would be interesting points of departure for further inquiry.

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