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ON THE VALUE OF INFORMATION – WHAT FACEBOOK USERS ARE WILLING TO PAY

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Abstract

In the age of Web 2.0 users contribute to platforms success by providing personal information by actively uploading information (e.g., messages, preferences, biographies) and also by leaving traces of their online behaviour as can be derived from their clicks, navigation paths, etc. While there is a market for trading such information among companies, there is little knowledge about how users actually value their personal information. In an online survey-based experiment we have asked 1.045 Facebook users how much they would be willing to pay for keeping their personal information. Surprisingly, 48.1 percent of participants are not willing to pay a single Euro, – thus, valuing their information at zero. Results indicate that people that show 'spamming' behaviour and users that use Facebook for 'diary keeping' are significantly more willing to pay a certain amount higher than zero to be able to keep their personal Facebook information. Interestingly, having analysed various kinds of user behaviour, the regression model still explains no more than 14.2 percent of variance. Additionally, this article discusses four different method manipulations for eliciting people's willingness to pay for personal information and provides methodical guidance for future research in the field.

Keywords: Facebook, Online Social Network, Willingness to Pay, Value of Information, Pricing, Personal Information.

1 Introduction

Analysts, investors and entrepreneurs have for long understood that comprehensive user profiles are the most important asset in the information economy. People's disclosure of personal information in online settings as well as their abundant online activities (e.g., searching, commenting, blogging, networking, liking, etc.), are a core asset of the information economy.

Online social networks (OSN), for instance, base their entire existence on this asset. If users flock to an OSN and have *active* profiles, the stock market values this accordingly. For instance, Facebook has about 845 million active users and expects between 75 billion and 100 billion USD for its 2012 stock market launch (The Economist, 2012). Considering that the company has few assets besides its user base (ad revenues are only around 2-5% of its valuation) (The Economist, 2012), it seems that the investors value each Facebook profile at 90-120 USD. In short, markets are developing valuations of user profiles and the more comprehensive and timely a profile is the more it is worth.

At the same time, users keep on providing their information for free. It seems that they have very little understanding of how much their information is actually worth to the OSN. Indeed, one could conclude that users do not value their information at all, because they constantly price it at *zero* as they provide it for free to the OSN. Or they value it somehow, but *trade* it for some service bundle in return (i.e. a convenient list of friends, free communication services, etc.). But do people really value their online profiles at zero? And if not, how much value would *they* put on their profiles? At what implicit price do they actually trade their information? Do they also value their Facebook profiles at 90-120 USD? Or would they actually be ready to sell all of their current Facebook information for much less than that?

These questions elicit an important shortcoming in our current understanding of information markets: We do not know anything about the true valuation of profile information. And with this knowledge gap comes a long tail of open questions: Are stock market prices for OSNs justified? Are all profiles worth the same price? What constitutes the worth of a profile? Is it acceptable to have profile data automatically deleted as some privacy scholars currently demand (Mayer-Schönberger, 2009). Or would users in contrast be willing to even pay for keeping information that they contributed to the Internet?

In this article make a modest attempt to approach this vast domain of personal information valuation. In doing so we take the user perspective. We asked 1.045 Facebook users how much they would be willing to pay (WTP) to keep and take ownership of their own Facebook information. We made them think that logging into Facebook one day Mark Zuckerberg (Facebook's CEO) would inform them of closing down the service. In order to be allowed to keep their Facebook profile information (friends, posts, pictures, wall posts, etc.) and transfer it to Google+, they would need to make Zuckerberg an offer for their profile. So we asked participants of the study how much they would be willing to pay for their profile in order to transfer the information. To get a reliable profile valuation from the sample we tested several variations of the Becker DeGroot & Marschak (BDM) method (Becker et al., 1964) to see whether and how this renowned WTP elicitation procedure could be transferred to the kind of online setting we chose and effectively elicit user profile valuations. We then analyzed whether users' own profile valuation could be explained by their online behavior. The contribution of our article is thus threefold: First (but least important), we win an insight into the absolute worth of Facebook information according to Facebook users. Second, we investigate different ways and challenges in applying the BDM method to elicit the value of an asset in an online setting. And third (and most importantly here), we win insights into what does and what does not determine people's valuation of their own information.

2 Theoretical Framework

In order to investigate how people value their personal information, we analyzed existing forms of information valuation.

2.1 Mechanisms to Evaluate Personal Information

In information economics the valuation of information is a well-known concept that has produced its own toolsets. For example, information economists frequently pick up the contingent valuation method that can be used to ask how much money individuals would be willing to pay to maintain the existence of a certain good, service, or information or what he or she would be willing to accept to be compensated for the loss of that good (Hanemann, 1991, Kim and Yeo, 2010). In essence, this method is particularly useful when assessing impacts on non-market goods, the value of which cannot be uncovered using revealed preference methods (which are based on the observation of 'real' preference behavior) (Pearce et al., 2006). Indeed the contingent valuation method is well known as an instrument in environmental studies and public policy to measure the value of goods that are difficult to price (such as public goods) and have no markets (Kim and Yeo, 2010). However, contingent valuation has its limitations. Particularly, there are severe concerns about the validity and reliability of the findings of contingent valuation studies (Pearce et al., 2006).

Privacy scholars try to identify the value of personal information taking a very peculiar perspective: Instead of investigating the asset's worth directly, most privacy scholars measure how much people would want to pay to keep it locked up. This is called the "willingness to pay to protect" oneself and scholars use different mechanisms to elicit it, mostly by means of auctions (Huberman et al., 2005, Grossklags and Acquisti, 2007) or conjoint analysis (Hann et al., 2002, Krasnova, 2009). Jaishingh et al. (2008) are one of the few scholars who take a market-approach, thus considering market players and their interaction, and suggest a model with three sets of agents (the consumers, the collector of information, and the third parties) that trade their information on a fictitious market. However, they only model the market. They do not run a simulation that would provide results concerning the monetary value for personal information. Summing up, privacy studies never ask for how much a profile is worth to a consumer. They only ask how much they are willing to protect. And this focus on protection will only lead to a valuation of sensitive information, while the bulk of the information traded on information markets is left out of the equation. Therefore, these studies' findings cannot be used to reliably evaluate the value a profile has for its owner.

Considering the drawbacks from information economics and privacy research, we therefore adopt a different approach to information valuation in the work presented in this paper. We evaluated different valuation procedures from the marketing domain that has a long tradition in examining how consumers value products and services. Often this value is expressed in individuals' willingness to pay (WTP) for a certain good or service. WTP is the *maximum* amount a person is willing to pay in order to receive or maintain a certain product or service (Hanemann, 1991). Many competing techniques for measuring consumers' WTP have evolved, including such mechanisms as choice-based conjoint analyses, open-ended state your price tactics or the Becker, DeGroot and Marschak (BDM) mechanism (for details cf. Miller et al., 2011, Breidert et al., 2006). Recently, evidence has emerged that BDM is probably the most effective way to elicit people's willingness to pay and thus elicit their true valuation of a product or service (Miller et al., 2011, Wertenbroch and Skiera, 2002, Breidert et al., 2006).

As part of the BDM procedure a potential customer states a price at which she would be willing to buy a good. However, the good is then not sold to her at the stated prices. Instead the purchase price is determined at random. This random purchase price is compared to the customer's stated price offer. If the randomly picked purchase price is lower than the price offered by the customer, she is obliged to buy the product at the random purchase price. If the randomly picked purchase price is higher than the price offer, then the customer is not allowed to purchase the product any more at all. The virtue of the

method is based on the fact that customers do not benefit from any strategic price determination. If they state a price that is too low they may potentially not get the product. If they state a price that is exorbitantly high, chances are high that it is beyond the final random price.

The challenge we faced, as we will show below is how to transfer the BDM price elicitation method to an online setting where the incentive to receive a certain product is not a tangible product, but the possibility to keep one's personal information. And where, in addition, no real sanctions are at work (such as losing one's personal information), but where the whole BDM mechanism is based on a fictitious scenario.

2.2 Drivers of Personal Information Valuation

Each person has his or her individual utility function because people's product or service requirements are different. Accordingly, individuals also have different willingness to pay (WTP) levels. From an economic perspective, the acceptance of a product or service and the WTP is in many cases dependent on the way that a person uses a particular product or service: The more or less intensive one is or plans to use a service, the more one is willing to pay. As a result, pricing schemes such as the pay-per-use principle are widely accepted among users (e.g., Kim, 2005). Against this background, we might expect that similar principles may be at work when people assign a value to their information: People who are posting a lot on Facebook and thus create more comprehensive profile information than others should have a higher willingness to pay for their information set. Not only have they invested more time in the creation of their profile, but they also have, in absolute terms, a larger set of information to transfer. Facebook users can be discerned into content producers and content consumers (Maia et al., 2008). Consequently, it is very likely that their Facebook walls will look differently. Content producers are likely to have put a lot of effort into the information that is then accumulated on their wall. At the same time, content consumers may have created much less information. As a result, it is likely that different behaviors on Facebook, which naturally lead to different kinds of profile walls, will also result in different degrees of willingness to pay for the profile. Accordingly, we expect that the depth of Facebook communication (frequency of postings) drives people's willingness to pay.

H1: Depth of Facebook usage drives the willingness to pay for one's Facebook information.

The size of a profile due to the frequency – respectively the amount – of postings is of course only one aspect of a profile. Different behaviors on Facebook are also induced by different reasons. For instance, reflective people may invest a lot of time and cognitive effort in their postings, while they post only few comments. Spammers may post a lot, while they invest only little cognitive effort into every posting (see Section 3.2). We refer to these 'bundles' of posting frequency, purposes for posting, and personal meaning for posting information on Facebook as '*behavior patterns*'. Accordingly, we hypothesize:

H2: Facebook behavior patterns have an impact on the willingness to pay for keeping one's information.

3 Method

We conducted a questionnaire-based online experiment. The questionnaire consisted of two parts: The first part contained a manipulation: By using four variants of the BDM method we created four different conditions to elicit Facebook users' WTP for keeping their personal information (not deleting it) (Section 3.1). The second part of the questionnaire asked people to report on their behavior on Facebook (Section 3.2) and their motives for using the service (motives: affection, inclusion, pleasure, relaxation, escape, control) (cf. Rubin et al., 1988). The questionnaire was distributed via the mailing lists of two European universities (Germany and Austria).

3.1 Measuring the Willingness to Pay (WTP)

To measure WTP for one's Facebook information we had to invent a credible scenario of a situation where people would be asked to pay for keeping their own data. We told people to imagine that they log into Facebook and cannot reach their information any more. Instead, a message from Mark Zuckerberg (Facebook's CEO) appears saying that he is tired of the business and therefore intends to shut down the platform. He wants to delete all the data on Facebook. They have only one chance to keep their information: Transfer the information to a service of comparable trustworthiness, Google+. Before doing so, they would, however, need to keep Zuckerberg from deleting their information. And the only way of doing so is by paying him for keeping their information.

The story was told in a 'Facebook atmosphere': the survey's background picture was a grayed-out Facebook profile and Zuckerberg's well known picture brought the bad news. Furthermore it was stressed that transferring personal information would be easy ('with one click') because having people think about effort that they would have to take could bias the amount they state.

Why did we adopt this story of buying information back? Our alternative would have been to ask people directly how much money they value their information. However, this would have meant to ask them for the value of something they have already provided for free and what they can access freely in any moment they want to. Consequently, this question would not have made any sense to the participants. So, instead, we asked users how much they would be willing to pay in order to keep their information (i.e. taking the ownership of it) to be able to transfer it. Considering that information portability is currently a widely discussed concept with regulators (European Commission, 2012), the scenario seems to be a realistic one.

However, when asking people directly for their WTP in surveys, they typically do not have an incentive to reveal their true WTP. We therefore adjusted the BDM procedure (Becker et al., 1964) to elicit people's true profile valuations. In our context it implied that we had participants state their willingness to pay for keeping their personal information. We informed them that Zuckerberg had no specific price expectation and would probably determine randomly on whether he would accept their offer or not. His random price would then be compared to their WTP for their information. If his randomly picked price would be lower than what they would be willing to pay for their data, then they would be able to keep and transfer their information. If his randomly picked price expectation would be higher than their offering though, they would lose their entire Facebook information.

If we had thus conducted our experiment through the real Facebook platform and threatened users in a real setting, they would have probably named their true WTP, scared to lose out on all their information. However, our set-up was a fictitious one. Participants had nothing to lose (except in their fantasy). Therefore we needed to create incentive-compatible behavior in a different way, threatening to take away something else if they would be over- or understating their WTP. We did this by threatening participants to not have them participate in a lottery that had been promised to them in return for their study participation. In manipulation A, we provided the incentive to win an iPhone 4S (high price product) if the participant's stated WTP was higher than Zuckerberg's random price. In manipulation B, we promised an Apple Adapter-Kit (low price product). In manipulation C, we applied the same procedure with the incentive to win a bundle of Apple products (iPhone 4S, iPod Shuffle, or Apple Adapter-Kit). In manipulation D, we adapted the BDM procedure in a way that users could only participate in the raffle for an iPhone 4S if their WTP was within a range of 10 percent plus/minus the average of other participants' WTP. In this manipulation D we therefore parted from the typical BDM lottery procedure. The reason why we manipulated in 3 conditions A to C the lottery products is because we could not exclude that the incentive's value would bias the stated WTP (which turned out to be true, see Table 1 below). The reason why we added one manipulation with a reference to other peoples' judgments was to see whether participants' consideration of other people's price judgments (rather than their own) would change the results.

3.2 Measuring User Behavior Patterns

Since there are no established scales to measure Facebook behavior, we conducted four in-depth interviews with Facebook users and one workshop prior to constructing the questionnaire. For these interviews and the workshop (with 12 participants) we asked interviewees to print out their entire Facebook walls. We then had them reflect on their postings and personal information. For every posting they had made in the past six months, we asked what had been the intention behind posting it. Furthermore we asked whether it was okay *to delete* the respective posting or whether the interviewees wanted to keep it. These interviews provided us with a decent understanding of motives and behavior patterns of different types of Facebook users, what parts of their information was important to them, and why other parts could be deleted. We found that some people use Facebook frequently and distribute nearly everything that comes to their mind. Others act as identity constructors reflecting a lot on what to post and in which form. Thereby they post only information that puts them in good light. Reflecting Facebook users are very thoughtful and post only sometimes and frequently read their own postings. Still other people primarily communicate via the Facebook wall with their friends, whereby the publicity of the dialogs does not trouble them. And finally there are those Facebook users who just read regularly their friends' news rarely post something themselves.

Built on the knowledge and experiences from these interviews and the workshop, we developed items for the questionnaire following the WTP scenario. We used 6-point Likert scales (fully agree – do not agree at all) for answering most items. Additionally, we included questions on every kind of activity one can do on Facebook (e.g., sharing videos, playing games, sharing links, like others' comments, etc.) and asked respondents how often they engage in these activities. For these, we used 17-point scales (very frequently – never).

With the resulting questionnaire we conducted three think-aloud interviews to improve the questionnaire (Rubin and Chisnell, 2008)).

4 Results

The gross sample we collected online consisted of 1.967 participants. For our analysis we only include participants with a high use of Facebook (once a week or more frequently). After deleting users that did not finish the questionnaire and one respondent with invalid and inconsistent responses, a final sample of **1.045** (370 male, 675 female) observations has been obtained. The participants were rather young (M = 24.52, SD = 4.75) with 93.5 percent students. Interestingly, 62 percent have a job, 16.9 percent are employed full-time, 20.2 percent part-time and 26.7 percent on occasion.

Our sample shows high usage of Facebook, as 86.6 percent of the participants log in daily. On average people are satisfied with Facebook (M = 10.29, SD = 3.61 on a scale from 1 not satisfied to 17 very satisfied).

4.1 Willingness to Pay for Facebook

A key result of our study is that almost half of the participants do not value their personal information at all. Across groups 48.1 percent of the participants state a WTP of 0 EUR for their data.

However, the method used to measure WTP has an influence on the amounts stated: As can be seen from Table 1, the lottery incentive's value seems to have had an influence on participants' WTP because of the anchors that the incentives set. Seen that people in manipulation D had their lottery participation dependent on the correct judgment of other peoples' profile valuations it may be that this manipulation provided the most realistic average estimate of Facebook users' WTP to save their profile from deletion. Or at least a valuation of what they think it is worth. This manipulation's average WTP is 9.45 Euro.

4.2 Factors Measuring Communication Behavior Patterns on Facebook

In order to explain WTP we first analyzed participants' stated behavior on Facebook. For this purpose we conducted a factor analysis (Varimax rotation), considering all factors for interpretation with an eigenvalue larger than 1.

Manipulations	N	Min	Max	Mean	Median	SD
Manipulation A with incentive iPhone 4S	147	0	150	15.27	2	26.017
Manipulation B with incentive Apple Adapter-Kit	226	0	100	5.60	0	12.654
Manipulation C with bundle as incentive	513	0	150	11.02	1	23.304
Manipulation D with +/-10 of average and incentive iPhone 4S	149	0	100	9.45	1	16.818

Table 1. Willingness to pay in Euro measured with different method manipulations

Factor analysis yielded 10 factors (Table 2). To name the factors we used 'factor pure' items where the criterion for purity is that the item's loading on the marked factor be at least twice the value of the next highest loading (Buchanan et al., 2006).

The 10 factors we identified reveal very different motivations for people to use Facebook. We found a specific behavior pattern that we named 'missionary communication' where users distribute interesting and important information to their friends. When people particularly post on other people's walls and update their status frequently (which appears in friends' newsfeed), we refer to it as 'attention seeking'. 'Identity construction' refers to the behavioral pattern that emphasizes building an online identity that puts oneself in good light, particularly for impression management reasons. As expected, we could identify factors concerning 'reading' and 'spamming', although the Cronbach's Alpha for 'spamming' is rather weak ($\alpha = .542$). An interesting factor is 'diary keeping', which relates to peoples' appreciation of having their own lives, and special moments in particular, documented on Facebook. This factor plays an important role with respect to the WTP as we will show below. The results also suggest that there are two types of reflections that Facebook users engage in: one is about one's own posts and one about what the posts would mean to the others. Additionally, factor analysis revealed the existence of business motive to use Facebook. This is when users accept their business partners and clients as Facebook friends even in their private Facebook profile. Interesting is the 'audience seeking' factor, which refers to users who have a high ratio of unknown people among their friends. It appears that such users seek for a large audience for their Facebook activities. Unfortunately, this factor shows a very weak reliability ($\alpha = .300$).

In a next step, our aim was now to explain peoples' WTP for their profile with the behavioral factors we identified.

4.3 Factors Driving the Willingness to Pay (WTP)

Since WTP was not normally distributed, we conducted a stepwise logistic regression analysis to explain whether people are willing to pay something or nothing for their profile information (Table 3).

Regression analysis suggests that the depth of use (number of postings) does not drive willingness to pay for information on Facebook. Although this variable showed to be significant in driving one's WTP, in stepwise regression it lost its importance. Thus, hypothesis 1 cannot be confirmed on the basis of the logistic regression we conducted. However, a separate single item analysis shows that those who log in less than daily would also pay significantly less for keeping their information ($F = 10.187$, $p < .001$). Our findings of hypothesis 1 are therefore mixed.

Also results concerning hypothesis 2 are mixed. On the one hand, the regression model only has a small explanatory value of 14.5 percent. This suggests at first sight that despite highly granular measurement of behavioral patterns these cannot explain one's profile valuation.

Factors → Questionnaire Items ↓	missionary communication	attention seeking	identity construction	reading	spamming	diary keeping	reflection on others	business	self-reflection	audience seeking
Cronbach's Alpha	.874	.833	.862	.768	.542	.713	.801	.789	.697	.300
I want to show others things that I find interesting (e.g., messages, news, music, videos, etc.).	.798	.076	.126	.100	.193	.085	.100	-.048	.018	-.007
I want to show others things that I find funny (e.g., cartoons, videos, etc.).	.811	.083	.022	.180	.136	.086	-.024	.027	-.024	.015
On my own wall I post information that the world should know about.	.636	.011	.163	.031	.095	.175	.187	-.039	.080	.033
I want to show others things that I find important (e.g., videos, links, etc.).	.871	.069	.137	.148	.120	.120	.037	-.013	.013	.006
I want to receive feedback to information that I found.	.682	.090	.274	.165	.140	.105	.058	-.023	.039	.030
I update my status.	.051	.851	.019	.060	.114	-.055	.001	.037	.119	.012
When I am on Facebook, I read friends' news.	-.007	.678	-.017	.112	.015	.058	.096	.014	.199	-.089
On the wall of others I post pictures.	.110	.852	.016	-.008	.006	.094	-.004	-.011	-.004	-.027
On the wall of others I post links.	.130	.813	-.012	.052	-.018	.005	-.049	-.015	.247	-.018
I use Facebook to put myself in good light.	.177	.013	.836	.068	.147	.100	.086	-.095	.036	.026
It is important for me to present myself as really good.	.142	-.008	.848	.101	.063	.139	.085	-.060	.039	.024
I like Facebook for the possibility to make a good impression on others.	.259	.004	.790	.100	.157	.202	.061	-.060	.046	.052
Sometimes I cannot wait to see whether there is news from friends.	.148	.018	.214	.660	.215	.181	.057	.044	.059	-.031
It interests me what others have to report.	.196	.064	.070	.794	.061	.104	.107	.010	.010	-.008
I am looking forward to postings of friends.	.268	.017	.128	.730	.054	.202	.042	.041	.016	.028
On Facebook I find friends' news boring.	-.010	-.105	.044	-.730	-.098	-.007	.097	.087	.048	-.037
I post on my wall rather everything that comes to my mind.	.182	-.051	.105	.131	.770	.173	-.041	-.037	-.022	.034
I prefer to write personal messages (e.g., via traditional e-mail or the Facebook messages function) than posting publicly on the wall.	-.188	-.167	-.117	-.128	-.623	-.013	.149	.115	.136	-.030
I'm glad that Facebook keeps moments that I can be reminded of later.	.262	.103	.144	.254	.027	.766	-.001	-.034	-.053	.038
I'm glad that Facebook documents my life	.192	.058	.250	.186	.267	.717	-.025	-.059	-.017	.030
Before posting something on my wall, I think about whether it could be important for others.	.049	.026	.044	-.011	-.075	-.019	.906	-.009	-.016	-.028
Before posting something on my wall, I think about whether it could be new and interesting for others.	.213	.022	.163	.081	-.034	.043	.862	-.022	-.019	-.022
Clients as Facebook-friends	-.051	.027	-.048	.005	-.058	-.005	-.012	.896	-.026	-.128
Business partners as Facebook-friends	-.017	-.002	-.120	-.018	-.077	-.045	-.017	.894	-.001	-.081
I delete postings from my profile.	.040	.239	.042	.007	-.018	-.042	-.026	-.004	.839	-.043
I think about my past postings.	.044	.355	.080	-.001	-.079	.035	-.009	-.030	.772	.053
Unknown people as Facebook friends	.006	.013	-.016	-.037	.040	-.012	.051	.191	-.020	-.827
Ratio of unknown people as Facebook-friends among Facebook friends	.070	-.096	.066	-.011	.182	.056	.005	-.018	-.022	.813
How many times have you posted in the past two weeks?	.418	.095	.096	.170	.568	.085	-.021	-.076	-.015	.161
I like with Facebook, that I can show, how I really am.	.274	-.006	.375	.203	.379	.449	.018	.020	.039	.065
When I read my own Facebook postings, it becomes apparent to me, how I really am.	.150	-.075	.268	.064	.527	.475	.165	.036	.137	.037

Table 2. Results of factor analysis with factor loadings and reliability measure

On the other hand, the regression identifies two kinds of behavioral patterns that clearly drive WTP: Using Facebook for 'diary keeping' has a high impact on WTP (odds ratio = .790, p < .001). It includes the behavior pattern to use Facebook for documenting one's life, and special moments in particular. Of similar importance is the factor 'spamming' (odds ratio = .706, p < .001) describing the behavior pattern of posting 'rather everything' on one's wall, which includes using the wall for personal communication.

Interestingly, as can be seen from Table 3, none of the communication *motives* measured seems to have an impact on the WTP.

		Logistic Regression				
		Final model total sample; N = 1,045				
	Variable	B	SE(B)	OR	95% CI	
Step 1	Depth of Use / Number of Postings (groups compared to "never in the last 2 weeks")					
	several times daily	.148	.549	1.159	.395	3.401
	1 time daily	-.031	.395	.970	.447	2.103
	2 to 3 times per week	-.143	.276	.867	.504	1.490
	1 time per week	-.265	.237	.767	.482	1.222
	1 time in the last 2 weeks	-.202	.203	.817	.549	1.216
	Number of Friends (groups compared to "more than 300 friends")					
	up to 100 friends	-.959	.211	**.383*** **	.254	.579
	100 to 190 friends	-.357	.212	.688	.453	1.042
	190 to 300 friends	-.527	.200	**.590** **	.399	.874
	Willingness to Delete	-.037	.172	.964	.688	1.349
	Manipulation (groups compared to Manipulation C with bundle as incentive)					
	Manipulation A with incentive iPhone 4S	.158	.200	1.172	.792	1.733
	Manipulation D with +/-10 of average and incentive iPhone 4S	-.146	.198	.864	.587	1.272
	Manipulation B with incentive Apple Adapter-Kit	-.285	.170	.752	.539	1.050
Step 2	Motive Affection & Inclusion	-.071	.081	.931	.794	1.092
	Motive Pleasure & Relaxation	-.151	.089	.860	.722	1.024
	Motive Escape	-.041	.071	.959	.834	1.104
	Motive Control	-.015	.089	.985	.827	1.173
Step 3	F Missionary Communication	-.134	.098	.874	.721	1.060
	F Attention Seeking	.022	.076	1.022	.880	1.186
	F Identity Construction	-.096	.074	.909	.785	1.052
	F Reading	-.009	.085	.991	.840	1.170
	F Spamming	-.236	.094	**.790***	.657	.949
	F Diary Keeping	-.350	.079	**.705*** **	.604	.823
	F Reflection about others	-.081	.067	.922	.809	1.051
	F Business	.002	.070	1.002	.874	1.148
	F Self-Reflection	.020	.067	.1.020	.894	1.163
	F Audience Seeking	-.113	.072	.893	.776	1.028

Note. B=estimated coefficient; SE(B) = standard error; OR=odds ratio; CI=Confidence interval;
* p < .05; ** p < .01; *** p < .001
R^2(Cox & SNELL) = .109; R^2(Nagelkerke) = .145; Hosmer and Lemeshow Goodness of fit Test: Chi-square = 4.695 (8), p = ns

Table 3. Summary of regression analyses: Predicting Willingness to Pay

In contrast, the number of Facebook friends makes a significant difference with regard to his or her WTP: Those users with less than 300 friends are usually less likely willing to pay some price higher than zero than those with more than 300 friends. Although for the group '100 to 190 friends' the difference is not statistically significant – which is probably due to the large standard error –, the odds ratio (.688) indicates that the effect is quite similar to the group '190 to 300 friends' (odds ratio = .590).

5 Discussion

A key finding of our study is the difference of the absolute values for people's WTP for their profiles compared by the group manipulations. The WTP levels were closely related to the selected incentives used as part of the BDM method as well as the method used in manipulation D. Our results suggest that the application of the BDM procedure in virtual settings is a challenge because the incentive compatibility created by the method in offline settings can hardly be transferred to online settings. We attempted to reach incentive compatibility through a lottery with different products. Even though logistic regressions analysis shows that WTP was not significantly impacted by the manipulation the absolute values for WTP stated by the participants diverged enormously between them. Since lottery incentives seem to provide such strong anchors for WTP results, a fruitful approach for future research in similar contexts might therefore probably be to not offer any incentives. This would of course undermine the idea of the BDM method. A limitation of the present study is that we did not include a control group without an incentive. The comparison would have yielded some insight into the importance of anchors.

A further experience of using our adjusted BDM procedure is that the presentation of the fictitious scenario is important for retrieving realistic results. As fictitious scenarios are also used in the contingent valuation method, particularly for intangible non-market goods, we could build on a well-accepted technique. In our experience, the detailed description of the scenario and its presentation with respective pictures made the scenario appear realistic such that the participants could easily understand it. In a separate study we could confirm this experience: In an open question asking participants to reason their WTP, they reacted very emotional and argued as if the scenario would really have happened.

When comparing the absolute Euro amounts users stated as value for their profile information with Facebook's estimated initial public offering on the stock market a dramatic divergence becomes apparent between users' own monetary profile valuations and the one of stock market analysts. In our study users valuated their profiles between 0 and 150 Euros, whereby the mean was zero. The stock market in contrast values a profile at approximately 90 Euros. An interesting research question would be to see whether users valued their information more if they knew that there is such a market. We have to acknowledge though that participants in our study were mostly students and therefore have less money to spend than a general population. A larger-scale study that would investigate the differences in WTP no a higher income sample is needed.

As this work is explorative in nature, we therefore looked for further explanations of WTP and included a validated scale for motives to communicate (motives: affection, inclusion, pleasure, relaxation, escape, control) in our analysis. However, we could not identify any motivational factor that influenced one's WTP.

An interesting finding is that the number of Facebook friends makes a significant difference concerning users' information valuation. Accordingly, we could conclude that the bigger the network of a user is, the more value one would also see in the information. However, this explanation addresses a limitation in our current work: In our study design with the four manipulations we did not differentiate between the 'pure' valuation of information and the valuation of the service to transfer information from Facebook to another OSN (as suggested in our experiment scenario). As this is an important issue, future research will address especially this limitation. We expect that the more Facebook friends a user has, the more he or she will be willing to pay for the service.

Delving into detail, analyzing the behavioral patterns of Facebook users, we could identify two significant indicators that drive users' WTP: The 'diary keeping' factor could be a representation for users who view their Facebook information as their personal documentation of life, which they want to keep and what they would pay for. Facebook's 'timeline' functionality, which was introduced only recently, addresses exactly this point and provides a presentation structure of people's information that emphasizes the documentation of life. We conjecture that the WTP of people, which score high in the 'diary keeping' factor, will rise after the comprehensive rollout of the 'timeline' functionality.

One might assume that users that score high in the 'spamming' factor would document their lives as diary keepers do. However the intention behind this behavior and the valuation of the information for the user appear different for these two factors. Spammers post more frequently than diary keepers do and probably also integrate less valuable information in their postings. Diary keepers are more selective. We conjecture that the absolute number of postings that spammers produce – rather then the frequency of posting (depth of use) – might be indicative for the higher likeliness to pay more than zero for keeping the information. Still, further research is necessary to explore the reasoning behind this finding.

However, despite the significance of several behavioral factors in influencing the WTP, the current model still does not explain a lot of the variance (only 14.5 percent). As already indicated above, a major limitation of our study design is neglecting to differentiate information valuation from service valuation (the value of using the OSN functionality). Furthermore, future research should consider that Facebook launched a series of initiatives that placed this OSN directly at the center of identity, sharing, and personalization – not just on Facebook, but across the World Wide Web. For instance, one can add a Facebook 'Like' button to any Website and take advantage of the power of viral distribution. It is necessary to address these additional effects separately, in order to be able to measure the value of the pure Facebook information.

6 Conclusions

In this explorative study, we investigated what variables drive the willingness to pay for keeping one's Facebook information.

We could identify some factors that drive the willingness to pay for one's personal information on Facebook. However, these explain only a small part of the variance.

Having taken into account attitudes, motives and behavioral patterns, this result raises the question, what else has to be taken into account for explaining the drivers for the WTP for keeping one's personal information.

When interpreting the results, we have to bear that our study has some limitations. For instance, the sample consists primarily of students, which is a user group with rather little money to spend. Furthermore, the group manipulations did not consider a control group without providing an incentive.

In order to increase the level of variance explanation, future research needs to address service (transfer) valuation, network effects, and the appreciation of Facebook functionality that allows integration across the World Wide Web. Additionally, we assume that the WTP will increase with raising people's awareness that their information is traded on the market for a particular price.

Furthermore, a major challenge in this study was measuring the WTP. It is important to develop reliable methodologies that are able to measure the WTP for non-tangible products or services (such as information) that are currently already used by people. By applying four methods and controlling for it in analysis, we were in a position to make statements concerning relative values (i.e., higher versus lower levels of WTP). Researchers in the information systems community should strive to come up with reliable methodologies that are able to capture absolute values.

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