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Endowment Effect: Do We Appreciate More Information from Books?

Experimental Evidence of the Effect of Physical Possession on the Endowment Effect and Emergence of the Quasi-Endowment effect

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Majetnický efekt: Ceníme si více informací z knih?

Abstrakt

Práce se snaží zodpovědět, zda si člověk cení informací z fyzicky dostupných (tištěných) zdrojů více než informací pocházejících ze zdrojů elektronických. Respektive, do jaké míry dochází u těchto médií k majetnickému efektu, projevujícího se více při fyzickém kontaktu s předmětem, který papírové zdroje informací poskytují zato virtuální nikoliv. V první části výzkumu je porovnávána ochota účastníků platit za fyzické a virtuální zdroje informací (WTP) s ochotou přijmout platbu výměnou za informace (WTA). Tento experiment neprokázal pravdivost předpokladu o přeceňování informací z tištěných zdrojů. Byla však zjištěna vyšší ochota nakupujících platit za informace z fyzických zdrojů, došlo k projevu kvazi-majetnického efektu. Výsledky ukazují, že subjekty byly méně ochotny platit za informace v elektronickém formátu. Druhá část výzkumu je založena na porovnání preferencí účastníků pro knihy v tištěné a elektronické podobě. Ukázalo se, že skupina účastníků, která obdržela knihu pouze v elektronické podobě, si k ní nevytvořila tak silnou vazbu a byla ochotna se jí vzdát výměnou za knihu jinou, u knih tištěných došlo k opačnému jevu. Druhý pokus tedy poskytl slabý důkaz ve prospěch tvrzení o větším vlivu fyzicky dostupných zdrojů informací na projev majetnického efektu. Dále je též diskutován vliv osobnostních charakteristik na míru majetnického efektu. V závěru práce byla pomocí dotazníkového šetření zjištěna averze ke ztrátě u informací a větší důvěryhodnost informací z knih pocházejících.

Klíčová slova: majetnický efekt, averze ke ztrátě, kvazi-majetnický efekt, informace, tištěné a elektronické zdroje, kniha, ochota platit (WTP), ochota platbu přijmout (WTA), experimentální ekonomie, aukce, osobnostní charakteristiky

JEL Klasifikace: C91, D03, D80

Endowment Effect: Do We Appreciate More Information from Books?

Abstract

The main purpose of this thesis is to answer a question, whether an individual appreciates more information originating from physical media than information from virtual media. Respectively, if these two types of media have a different impact on the endowment effect. This effect is conditioned by the individual's physical possession of an object that is provided by physical media, but not allowed by virtual media. The first part of the experiment is based on the comparison of buyer's willingness to pay for information from physical and virtual media (WTP) with seller's willingness to accept payment for the information (WTA). The results from the first part of the experiment did not satisfy the hypothesis about participant's higher valuation of information from physical media. But it was found out that buyers were more willing to pay for the information from physical media suggesting the emergence of quasi-endowment effect. Subjects were reluctant to pay for the electronic version of information. The second part of the experiment is based on comparison of participant's preferences for books in regular and virtual format. It was proved that participants who had an experience only with the book in electronic format were more eager to exchange it for the other book. The opposite effect was documented for participants who had the book in regular format. So, the results from the second part of the experiment provided weak evidence on behalf of the prediction about greater impact of physical media information on the endowment effect. The thesis is further focused on detection of personal characteristic's impacts on the endowment effect. Finally, it was discovered that subjects felt loss aversion of information and that information from books was perceived trustworthier.

Key Words: endowment effect, loss aversion, quasi-endowment effect, information, physical and virtual media, book, willingness to pay (WTP), willingness to accept (WTA), experimental economics, auction, personal characteristics

JEL Classification: C91, D03, D80

Prohlášení

Na svou čest prohlašuji, že jsem práci vypracovala samostatně za použití uvedené literatury a zdrojů.

……..

Ludmila Hadincová,

V Kralupech nad Vltavou dne 25. května 2011

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[1] Experiment took place in the Laboratory of Experimental Economics (LEE) at the University of Economics in Prague on 16th May 2011.

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Introduction

The theorem of endowment effect lies on the intersection of economics, law and psychological science. Generally, endowment effect explains a tendency of sellers to overvalue their goods more than potential buyers do. To put it simply, a person who is provided with the good – say coffee mug – would not be willing to sell it for 100 CZK, but in some parallel universe the same person with absolutely identical preferences would not be willing to buy the same mug for more than 50 CZK. This instant change in preferences contradicts standard textbook economic rationality assumption about preferences independent on initial endowment. The phenomenon of endowment effect has been frequently treated from many different perspectives by many authors. I mention them in the first part of my thesis, but I would mainly focus on the effect of physical possession of the item on its valuation. Authors like Jack L. Knetsch, Wei-Kang Wong (2009), Jochen Reb and Terry Connoly (2007) have proven that physical contact with an item is an important driver of the endowment effect. I apply this fact on the somewhat specific good – information. I distinguish between information originating from paper and virtual media. So, the assumption is that people would value more information from paper media. This might be amplified by the fact that people trust more information from books. I also test this statement in the last part of my study. I build on the theory of Jack L. Knetsch and others mentioned above and I combine it with some implication resulting from theory of Nils B. Jostmann, Daniël Lakens and Thomas Schubert (2009) about effect of experiencing weight of the item on individual's decision. Authors experimentally discovered that people who were holding a heavy object judge information to be more important than people who were holding light object. Because paper media like books are heavy, individuals holding them might be influenced by this "weight effect" and thus consider information from books or other physical media to be more important and assign higher monetary value to them, which possibly intensify the endowment effect. Apart from weight theory there are other factors able to raise perceived monetary value of physical media information like different brain reaction on the print text suggesting greater emotional internalization of information originating from tangible material (Brown 2009). I used two ways of experimental treatment of the endowment effect by comparing participant's willingness to trade (willingness to accept payment for information –WTA and willingness to pay for the information WTP) and willingness to exchange the information in two groups – virtual and physical media information group. I also employed one control group of induced value voucher in which the endowment effect should not be observed. The procedure is described in section number 3. The first test of participant's willingness to trade the information did not reveal a difference between physical and virtual media, because data for both groups demonstrated some sort of WTA-WTP disparity. But in comparison with control group which also showed

disparity between selling and buying prices of traded voucher I conclude that this is not complete evidence against the hypothesis. Apart from endowment effect testing I found an evidence of quasi-endowment effect on the side of buyers in the physical media information market. Buyers were exceedingly less willing to buy information in electronic format, possibly because they felt that it was worthless to pay for information that might be easily available online for free. Results from the second test correspond to the theory. Subjects endowed with the paperback version of the book were less willing to exchange it, in contrast to participants endowed with the electronic version of the book.

As a complement to previously mentioned experimental testing I also involved econometric model explaining participant's willingness to accept and willingness to pay for the information in physical and virtual media information groups based on explanatory characteristics about individual's gender, personal income, perceived status of happiness (Lerner et al. 2004), curiosity (Niels van de Ven et al. 2005), materialism (Lens et al. 2009), sentimentality (Croson et al. 2009) and others. None of the variables was significant due to limited number of observations in each group. With respect to the constrained explanatory power I found that women were keener to keep their endowment which was also true for more materialistic people. The third stable result is that more curious people were more willing to sacrifice their endowment. Effects of remaining variables are mixed. Reader might find the regression analysis in the section number 4.

In the last part of my thesis I describe two other complementary studies. Aim of the first one is to verify whether an individual experiences loss aversion in case of loosing and gaining an additional piece of information. To find the answer I provided participants with the questionnaire asking for their hypothetical WTP for additional information and WTA for missing information. For example I asked how much an individual would be willing to pay more for the unit pack of raw meat with information about the place of its origin, and how much an individual expects to pay less for the unit pack which does not include that information. Based on the theory that loss aversion is commonly demonstrated by the disparity between WTA and WTP I found an evidence for verifying the hypothesis. Participants assigned greater subjective value to the loss of information than to its gain. The results can be found in the section number 5. Finally, I focused on the effect of different media on the trustworthiness of information using questionnaire with two versions. Both versions included the same pieces of information, but they had different references. One reference was based on the book and the second reference was based on the online source. I found weak evidence for the benefit of the hypothesis, that people trust information from books more.

To summarize, my thesis is divided into five sections. In the first section I focus on the theoretical background of the endowment effect and its experimental testing. In the second

section I describe specific features of information as a good and differences between print and virtual media possibly affecting the endowment effect. The third section is given to experimental design and its results. The fourth part includes regression analysis. Two complementary tests about loss aversion and trustworthiness of information can be found in the last fifth section.

1.1.1Loss Aversion and Reference-Dependent Preferences

"When the endowment effect exists, the person has no indifference curve." (Hovenkamp 1991, p. 227 – cited by Curran 1999 p. 824)

Standard "textbook" economic theory implicitly assumes that preferences do not depend on the reference state. As a result indifference curves are drawn without evidence of the impact of initial endowment. Contrarily the reference-dependent model based on a loss aversion phenomenon understands individual's preferences in a different way. Generally, the theorem of loss aversion states that individuals value losses more heavily than equivalent gains. To put it simply, the absolute value of disutility from loosing 100 CZK is significantly higher than the absolute value of utility from gaining 100 CZK (subjective disutility is much higher than the standard theory predicts). Loss aversion is the first proposition from three properties of the value function – the cornerstone of prospect theory designed by Daniel Kahneman and Amos Tversky (1991). The properties are reference dependence, loss aversion and diminishing sensitivity. Reference dependence means that losses and gains are valued relatively to the reference point and characteristic of diminishing sensitivity demonstrates that the marginal value of both gains and losses decreases with their size. Those propositions give us an asymmetric S-shaped value function. Value function is convex for losses and concave for gains. The convex part is generally steeper than the concave part, suggesting a greater marginal value assigned to losses than to gains. The inflection is situated at the reference state, which might be the status quo status (1990) (see appendix). Authors also analyzed consumer's behaviour in risky and risk-free choices and found large body of evidence for their theory (1979), (1990). One of their implications is the so-called endowment effect which is my primary point of focus in this paper.

1.1.2 Endowment Effect

"The tendency for owners to value objects more than potential buyers is among the most widely studied judgment and decision making phenomena." (Maddux et al. 2010, p. 1)

"Because the people who own lava lamps demand more to give them up than the people who do not own lava lamps will pay to for them, deals go unmade, and storage lockers remains filled with lava lamps that are destined never again to glow." (Morewedge et al. 2009, p. 947)

"The endowment effect is the most robust manifestation of loss aversion" defined by Daniel Kahneman and Amos Tversky in the concept of prospect theory (Knetsch, Fang-Fang Tang, Thaler 2001, p. 257). If the purchase of the good is coded as a gain, the buyer's maximum financial amount that she is willing to pay (WTP) would be lower than the minimum financial

amount that she is willing to accept (WTA) as an owner to sell the same good (1979). Richard Thaler labelled this discrepancy as an endowment effect because the value of good changes immediately when it is incorporated into one's endowment (1991). Experimental testing proved that the subjective value of the good depends on the ownership status which is the reference point from which individuals codes losses and gains resulting from trading. Thinking theoretically, it has an implication for indifference analysis. If the indifference curve is drawn without reference to initial endowment a person who is indifferent between good A and B is supposed to judge situation in which she owns good A from the same perspective like the situation in which she owns good B. But the empirical testing demonstrates that once an individual owns good A, she prefers it over good B and vice versa. I describe the way how endowment effect is tested in section 1.2.1.

1.1.3 Quasi-Endowment Effect

Some researchers also found out an evidence for so called quasi-endowment effect. The quasi-endowment effect is not experienced by sellers but by buyers and was documented mainly during competitive auctions. Generally, bidders in competitive auctions begin to feel as they already own the item and assign higher value to it; therefore they are more willing to spend more money for the item (Ariely et al. 2004). So, the effect of physical media information on the quasi-endowment effect can be greater, because sellers become easily attached to items that are physically present.

1.1.4 Physical Possession and Reference Point Establishment

For reference dependent preferences, it is especially important to establish the reference point. Like other scientists for example Jochen Reb said: "The endowment shifts the reference point, and thus the assessment of what is a loss and what is a gain"(Reb, Connolly 2007, p. 107). At this point I would like to introduce one factor that might amplify the magnitude of the endowment effect; physical possession of the object. Ownership with lack of physical possession can undermine reference dependent preferences, such that an individual does not feel selling of a good as a loss but rather as a forgone gain. Jack L. Knetsch and Wei-Kang Wong (2009) discovered that people who were owners, but did not have a physical experience with the object did not feel the pain of loss in contrast to people who were not owners but who had physical experience with the object. In one experimental session Jack L. Knetsch and Wei-Kang Wong observed the endowment effect in the group of participants who held and object for a while (no owners), but did not observe it in the group of owners who were not holding the object (owners). The other evidence was provided by Jochen Reb and Terry Connolly. Authors examined the effect of possession on individual's valuations of the object and found that

possession had had even greater impact on the WTA-WTP measures of values than the factual ownership status. For example a person who has paperback version of her favourite book would feel more pain from loosing that book than other person who has her book only in electronic format. Jochen Reb and Terry Connolly (2007) estimated and proved that the physical experience with the good is linked to person's subjective feeling of the ownership (see appendix, illustration #2). And feeling of ownership is the driver of seller's over-evaluation of the good she gives up (see appendix, illustration #3). To conclude the physical possession of a good is a crucial factor of ownership reference status establishment. A person, who does not have a physical experience with the item she owns, is not tempted to assign higher value to it. James R. Wolf, Hal R. Arkes, Waleed A. Muhanna (2008) confirmed this finding by further experimental testing and illustrated that the effect got stronger for longer duration of physical possession of an object. So, probably, there is no endowment effect without physical possession. I would consider this fact again in section 2.2.2.

1.1.5 Other Factors Able to Influence the Magnitude of EE

Various factors were previously tested for their possible impact on the endowment effect's magnitude. For example the history of ownership has a positive impact on the valuation of trading object (Strahilevitz, Loewenstein 1998). So does personal association with owned object (Beggan, 1992). In case of exchange good the magnitude of endowment effect is driven by subject's curiosity about the outcome (Niels van de Ven et al. 2005). Some theoreticians demonstrated that people are more willing to exchange similar items (Chapman, 1998). It has been also demonstrated that some personal characteristics like materialistic attitudes of sellers. Materialistic person assigns higher value to her ownership and that fact drives the maximum selling prices up (Lens et al. 2009). Incidental emotions like sadness or disgust have negative impact on the endowment effect (Loewenstein et al. 2004). So, personal happiness might be the other trigger of endowment effect. Cultural differences might also play a role. One international study of the endowment effect has proven that the overvaluation of ownership is more typical for Westerners than for East Asians (Maddux et al. 2010). The last two factors have potential to produce the reverse endowment effect. [2]

[2] Reverse endowment effect is described by the WTA-WTP disparity like the endowment effect, but in this case the WTA is lower than the WTP. In the study of Jennifer Lerner, Deborah A. Small and George Loewenstein (2004) this is caused by sadness that makes people more willing to trade the item for a financial amount, because they are not satisfied with current situation, so they are tempted to actively change it. Than they feel like the selling of their ownership is an action toward the new status. Reverse endowment effect in the study of Maddux is related to self-construal's judgements typical for East Asians and endowment effect is associated with self-enhancement's judgements typical for Westerners. A person

1.2.1 Experimental Testing of the Endowment Effect

Generally there are two ways how to test the presence of the endowment effect both of them first used by Daniel Kahneman and Amos Tversky in 1979. The first method is based on the comparison of disparity between willingness to accept (WTA) and willingness to pay (WTP) measures of value. If the valuation of an object is not affected by loss aversion and if ownership does not influence the reference point, WTP and WTA measures of value are supposed to be nearly equal. But if the ownership is regarded as a reference status then WTA will significantly exceed the WTP, because the exchange of the good makes buyers to experience a minor satisfaction from the gain but makes sellers to feel a considerable discomfort from the loss. In this kind of experimental setting participants are randomly assigned to one of two groups. Subjects in the first group are endowed with the good (usually a mug, pen or chocolate bar). Subjects in the second group are not endowed with the good but they are able to acquire it within the experimental session. The exchange is commonly conducted by using the Becker–DeGroot–Marschak mechanism (BDM) or by using the mechanism of market clearing price. Each participant is asked to reveal her maximum buying or minimum selling price depending on her owner status. The measures of value are collected and the market price is established. Under the BDM mechanism the market price is picked up randomly.[3] Under the market clearing price condition the equilibrium price is set up at the intersection of WTA-WTP measures of value. All transactions are conducted for that price. To verify the hypothesis about the existence of endowment effect WTA-WTP measures of value are averaged and compared. If the results reveal statistically significant disparity between WTA-WTP the endowment effect might be the explanation of such discrepancy (Smith 1994).

The second experimental approach is based on the comparison of willingness to exchange one good for another. In this experimental setting, participants are randomly assigned to one of three groups – two groups of owners with two different goods and one group choosers. In the

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with self-enhancement's judgements is less critical to her selves than to others, so she values her items more. A person with self-construal's judgments is more critical about her selves, thus, she values less items owned by her. Self-construal's judgements result in the reverse endowment effect.

[3] Commonly, under the BDM mechanism each buyer elicits her bid by choosing from the scale buying prices and than the market price is found using random number generator. If the market price is lower than participant's bid she is required to pay the market price and gets the item. The other possibility how to formulate bids and offers is to ask an individual to decide between sequentially or randomly ordered combination of the item and amount of money. Than she choose if she prefers the money or the item. After it the price is randomly chosen and if it is lower than the money amount that she is willing to pay for the good, she is required to purchase it for the random price. The mechanism works in an opposite way for sellers,

group of choosers, subjects are asked to choose between two goods (usually a mug, pen or chocolate bar). In the first group of owners participants are endowed with the first good and asked whether they are willing to exchange it for the second good (e. g. mug for chocolate bar). The procedure in the second group of owners follows the same rule. To verify the hypothesis about existence of the endowment effect, proportions of owners of each good in all groups are compared. If the randomisation is done correctly, the percentage of owners of the first good (let's say a mug) in the group of choosers should be equivalent to the percentage of mug owners in groups of owners. But if the endowment effect influences the individual's judgements, the relative proportions would differ. Simply put, a person in possession of a mug is not willing to exchange it for a chocolate bar, because the happiness of getting the chocolate does not offset the pain of losing the mug. If she were randomly assigned in the group of chooser, she would prefer chocolate (Kahneman, Tversky, Thaler 1990).

1.2.2 Critique of the Experimental Testing of Endowment Effect

"One shot experiments almost never produce behaviour consistent with economic theory."

(Coursey, Hovis, Schulze 1987, pp. 681)

First, I would like to mention another possible theoretical explanation for WTA-WTP disparity. Michael Hanemann's theory stands in contrast to Kahneman's prospect theory. Michael Hanemann argues that it is not necessary to reject classical indifference curve analysis (1991). On the contrary he says that the WTA-WTP gap is compatible with standard indifference curve and the magnitude of the gap depends on the level of substitution between goods – say good A (mug) and good B (money). The less a good is substitutable with money; the larger will be the endowment effect. So, according to Michael Hanemann the WTA-WTP ratio would be high e.g. for environmental goods, such as clean air and the WTA-WTP ratio would be low for ordinary consumption goods (Curran 1999). As a body of evidence author claim that after repeated market trials the disparity between WTA and WTP for consumption goods vanishes but that it remains unchanged for less money substitutable goods.

Secondly, I would like to discuss the empirical testing of endowment effect. The standard explanation for the WTA-WTP gap observed within experimental markets are transactions costs, inexperience of participants with the good being traded and unfamiliarity with trading rules (Knetsch 2009). The problem with transaction costs is not crucial under experimental conditions because they are almost equal to zero. The problem of unfamiliarity with trading rules might be avoided by detailed explanation of the trading procedure to participants. So only the last problem, that is, unfamiliarity with trading rules, could cause difficulties in the sense that it might be the cause of the WTA-WTP. Like John A List (2008) declared market experience with trading good in the real setting attenuate the WTA-WTP gap in the laboratory setting. Thus,

when the experimental good is not usually traded in the real market, the disparity between WTA and WTP measures of value could be caused by naïveté of participants about the selling and buying prices. This is usually solved by adapting repeated market trials (Coursey, Hovis, Schulze 1987), (Shogren, Shin, Hayes, Kliebenstein 1994), (and others). Participant's reluctance to trade might be also caused by her previously adapted behaviour pattern. Some researches illustrated that after subject suffered a loss in one trial he was less willing to participate in exchange in the following trial, although the experimental environment had changed. This was called a caution heuristics. So, once a person set up in one type of market behaviour, she becomes rigid in decisions and less likely to quickly adapt to a new environment which behaviour would bring her higher payoffs (Linsay 2011).

1.2.3 Is the WTA-WTP Disparity Triggered by the Way Questions Are Framed?

Charles Plott and Kathryn Zeiler (2005) pointed out the problem of questions that are used to elicit the WTA-WTP measures of value by explicit asking owners to reveal their "selling price" and buyers to reveal their "buying price". Thus, due to different framing of questions participants might feel they are supposed to bargain about the price – overstate the selling price and understate the buying price, because they set up the roles of buyer and seller without the effect of loss aversion, status quo bias or ownership. Plott and Zeiler expressed doubts about the eliciting mechanism based on such questions.

The effect of question framing has been widely studied by researchers like Richard Thaler, Amos Tversky and Deborah Frisch. Among others they demonstrated the importance of the reference point for the value elicitation. Consider the well-known example with wine merchant and wine buyer (for example see Frisch 1993).

(1) Back, in the 1950's you purchased a case of good wine for 5 USD per bottle. Today, a wine merchant offers to purchase it from you. How much would you be willing to sell a bottle for?

(2) You have just heard that a wine merchant has a case of good wine dated from the 1950's. He purchased it for 5USD per bottle. He now wants to sell it. How much would you be willing to pay per bottle?

The minimum selling prices and maximum buying prices differ significantly and subjects do not see any reason why these situations should not be treated differently. One participant says, "I would want to get as much as I could from a buyer, but spend the least possible amount if I were the buyer." These results propose one thing. Yes, the framing of questions is important and it has an impact on WTA-WTP measures of value, but is this a problem of experimental design? My answer is no. In order to find subject's buying and selling prices that are not influenced by the

question framing it is better to involve real money payoffs like I would discuss below. The possibility of subjects to behave strategically as a result of their perception of what they are supposed to do could be remedied by repeated market trials that are potentially binding and involve real payoffs. Some authors have employed the mechanism of Vickrey auction that is supposed to be truth-revealing to get the "real" values of selling and buying prices (1961) like Don L. Coursey, John L. Hoviz and William D. Schulze (1987) or Jack L. Knetsch, Fang-Fang Tang and Richard Thaler (2009).[4] Other authors like Elizabeth Hoffman and Matthew Spitzer rejected the use of hypothetical questions at all (Curran 1999). To conclude, the best way how to avoid sellers and buyers strategic behaviour is designing an experimental procedure involving real money payoffs rather than hypothetical questions. In the main part of my study I use real payoffs. In the complementary research I also involve hypothetical buying and selling questions.

1.2.4 Is the WTA-WTP Disparity Driven by Subject's Misconception of Experimental Procedure?

Charles Plott and Kathrine Zeiler (2005) also argued that the WTA-WTP gap was not evidence of the endowment effect, but it resulted from the poor explanation of the value elicitation mechanism to participants. Thus, even after repeated market trials participants do not understand the mechanism and their value measurements are biased. Authors have designed a procedure that was supposed to avoid the subject's misconception. It is based on four pillars – anonymity of subjects, incentive compatible eliciting mechanism, training and paid practice. The study of Charless Plott and Kathrine Zeiler brought us a very strong result. They explicitly say that the endowment effect might be turned on and off by using their experimental procedure.

[4] But surprisingly their results are not the same. The repeated second price Vickrey auction leads in the parity of WTA-WTP measures of value in the study of Coursey et al. but results in the disparity of WTA-WTP measures of value in the study of Knetsch et al. So the question of endowment effect resistance towards repeated market trials remains unsolved. Different results of these experiments might be caused by the poorly designed Vickrey auction in both studies. Coursey et al do not use the second price auction but fifth price auction. Knetsch et al use the ninth price auction. In fact none of them is truth revealing, because Vickrey explicitly says that only the second price auction is powerful to do this (Vickrey 1961). But because Knetsch also uses second price Vickrey auction the conclusion might be based on his experiment resulting in WTA-WTP disparity.

1.2.5 Does a Consensus Exist Regarding Experimental Testing of the EE?

There is no exact consensus about the experimental procedure. The experimental market is usually conducted in the same way in all studies, but the procedure differs from one experimental market to another. Comprehensive summarisation might be found in the study of Charles Plott and Kathrine Zeiler (2005). They described experiments of the WTA-WTP disparity from 1984 to 2001 according to four features (pillars) described in the previous section and found that experiments were actually very different.

1.2.6 Does a Consensus Exist Regarding Experimental Results?

The experimental procedure differs from one study to another. So do experimental results. The evidence of the endowment effect WTA-WTP disparity is not always revealed. From 40 experiments discussed by Charles Plott and Kathrine Zeiler 12 experiments did not prove the endowment effect. Approximately half of them used the Vickrey auction, which is supposed to avoid participant's strategic behaviour. The parity was also found in two studies based on the BDM mechanism and there were also Vickrey auctions that revealed the WTA-WTP disparity. So it is not possible to anticipate in which market environment the Endowment effect would show up and results are still unstable.

1.2.7. Conclusion

In this section I would like to briefly repeat the main points of the first part of my study. At first the endowment effect is widely observed in the tendency of owners to overvalue their items. Thus, the reference point is crucially linked to the ownership status and ownership is amplified by physical possession of the item. Secondly the endowment effect is tested in two ways – using both willingness to trade and willingness to exchange mechanisms. Finally there is no consensus about the proper experimental mechanism of eliciting the WTA-WTP measurements of value. So the variability of results among different experiments is highly expected and inevitable.

2.1.1 The Endowment effect and Information

The effect of ownership on the valuation of information has not been widely studied yet. As far as I have found there is only one study focused on that phenomenon. Daphne R. Raban and Sheziaf Rafaeli (2003) found that the information trading is in agreement with endowment effect theory, namely, people value information they own much more highly than information not owned by them.

2.1.2 The Value of Information

Information is a special kind of goods. "It is both the endproduct and an instrument or input into the production of other goods and decisions" (Raban, Rafaeli 2003 p. 2). The utility of information is indirect – it is mainly used for supporting decisions. Another problem with the value measurement is that information is an experience good whose value can be revealed only after use. Information might be instrumental or noninstrumental. Instrumental information influences an individual's decision, while noninstrumental information does not.

2.1.3 Why Do People Demand Information?

Even objectively worthless information might have a subjective value, because individuals are tempted to seek information. It is suggested that people accumulate information because it seems to be the right thing to do. The second explanation discussed in Raban-Rafaeli (2003) study is that people tend to search for information, because they might need it in the future. Both of these explanations could lead to a high demand for otherwise useless information. Over demanding of information that cannot be used as a support for decision making is sometimes called information bias. It is called bias because it describes an individual's temptation for searching information even when she a priori knows that the costs of finding will exceeds gains from it (Baron 2007).

2.1.4 Why Do People Sell Information?

"The production of information is costly, but the reproduction is exceedingly less expensive" (Raban, Rafaeli 2003 p. 2). Individuals might reproduce information by sharing or by trading. When the information is distributed by trading, the endowment effect might result in a lower frequency of transactions even with respect to the fact that a piece of information is almost indefinitely reproducible, because an owner of the information does not loose it by sharing or sometimes trading.

2.2.1 Information in Physical and Virtual media

The same information could be distributed via different media. Physical media, such as a book or journal, provide different experience to the reader than virtual media do. And above all people do not value only information, but they assign value also to the media itself. Book or magazines are not only the collection of words; otherwise they are valuable goods too. People who love books would not change them for the electronic version because they might miss the physical contact. The main reason of such overvaluation is that physical media stimulates more than one sense – sight and touch. According to Jack L. Knetsch and Wei-Kang Wong (2009), it is reasonable to estimate that an individual might value information from physical media more than information from virtual media. And there are other factors possibly amplifying the magnitude of endowment effect. The main task of this section is to discuss these factors.

2.2.2 Is the Touch Important?

Haptic sensation has the power of affecting individual's judgements and decisions. Based on the theory that abstract concepts like importance, difficulty or rigidity are grounded in the bodily experience of weight, roughness or hardness, Joshua M. Aackerman, Christopher C. Nocera and John A. Bargh (2010) found that incidental haptic experience works as a trigger for association with the abstract concepts and their application to an individual's judgments. For example, people who hold hard object become more rigid in their opinions than people who hold soft object. Combining the theory of Knetsch, Wei-kang Wong and Ackerman, Nocera and Bargh, I would suggest that haptic sensation, provided by physical media like a book or journal, might result in stronger reference point establishment followed by higher valuation of information originating from the physical media.

2.2.3 Is the Weight Important?

Further experimental testing of haptic sensation brings interesting results about the effect of weight on an individual's decision. Nils B. Jostmann, Danïel Lakens and Thomas W. Schubert (2009) find that individuals who hold a heavy object have a higher expectation about the monetary value. In their study participants were divided into two groups. One group got a heavy clipboard (to experience weight) and the second group got light clipboard. The task of all subjects was to guess importance and value of given sample of foreign currencies. In accordance to their theory individuals in the group with heavy clipboard assigned higher importance and monetary value of currencies than individuals in the group with light clipboard. The other study of the impact of weight on value judgements by Iris K. Schneider, Bastiaan T. Rutjens, Nils B. Jostmann and Daniël Lakens (2011) did not find that people assign higher value to the object

itself.[5] This result might be again connected with the overvaluation of the physical media information, rather than overvaluation of the physical media itself.

2.2.4 Is the Different Brain Reaction Important?

The human brain reacts differently to print and virtual text. Virtual and physical media have a different impact on the emotional processing of information.[6] Using functional magnetic resonance imagery, Milward Brown (2009) found that information printed on paper left a deeper footprint in the brain even without involving touch. He also declared that physical media enhance more emotional processing and produce more brain responses connected with internal feelings and memory. His three conclusions imply greater internalisation of information originating from tangible materials. To put it simply a person is more likely to remember information from the physical media and she is also more likely to create an emotional association with information from physical media. Greater internalisation of information originating from the regular format of book is supported by Maria T. de Jong and Adrina G. Bus (2002) in their study of children's learning process in reaction to the same book in regular and electronic format. The link with the endowment effect is stronger emotional internalization. I guess that an individual would value more information from the physical media, because they leave a deeper footprint in the brain.

2.2.5 Conclusion

In summary, there are three factors connected with physical media that are able to influence an individual's valuation of information – touch, weight and greater emotional internalisation.

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[5] Jostmann et al. tested the effect of weight on the perception of importance and monetary value and Schneider et al tested whether importance affect the judgments about weight. In their study all participants were provided with the same book and the half of them was told that the book was important. Subjects in this group guessed the weight of book to be much higher than participants in the group without the information about book's importance.

[6] Milward Brown conducted an experiment with 20 participants who were presented with the same advertisement either in virtual or printed version. While subjects were watching the marketing messages they were installed under the fMRI scanner.

3.1.1 The Experimental Design

I use both experimental methods described in section 1.2.1. They are conducted with the same participants and the assignment stays the same too. I also include two auctions one for each treatment group described in section 3.1.4.

3.1.2 Method I.

Participants

66 students[7] commonly from the University of Economics in Prague participated in the experiment for the show up fee 100 CZK and financial premium of 200 CZK. There were 18 women and 48 men in the sample. The mean age was 23. The experiment took place in the Laboratory of Experimental Economics at the University of Economics in Prague on 16th May 2011.

Assignment

Students were randomly assigned to one of three groups – physical media information group, virtual media information group and control group. Each group was divided into two smaller groups according to the initial endowment (voucher/200 CZK), (hard copy of candidate's information/200 CZK), (pdf candidate's information/200 CZK). Thus, in each market condition there was a group of sellers who owned information about candidates or vouchers and a group of buyers that did not own them, but who were provided with the initial financial amount of 200 CZK.[8]

Procedure

Control: Induced value voucher market

Participants were randomly assigned in a group of owners or buyers. The initial endowment was issued together with instructions. Owners received the voucher (see appendix) (exchangeable for 200 CZK) and buyers received 200 CZK. I explained the market procedure to all participants.

[7] Originally, experiment was design for 72 participants (24 subject per one group), but 6 participants did not came. So, there were 20 people in the first group, 22 people in the second group and 24 people in the third group.

[8] The information includes each candidate's curriculum vitas in Czech and English. It has 18 pages. To satisfy the external validity the information about candidates includes notation they originates from Grafton which is a Czech human resources agency well known between students. For seeing information please contact me: lida.hadincova@gmail.com.

Experiment had eight market trials. In each trial owners were asked about their minimum selling price – WTA and buyers were asked about their maximum buying price - WTP. Participants elicited their values using sheets with range of prices ordered from 0 CZK to 300 CZK in steps of 10 CZK. I collected bids and offers and announced the market price for each round. One round was randomly selected to be valid at the end of the experiment. All transactions were done for the market price from that trial. After transactions between owners and buyers have been concluded, final owners received the face value of the voucher 200 CZK. Finally, all participants were provided with two questionnaires (see appendix).

Treatment: Physical media information market, Virtual media information market

Participants were randomly assigned in a group of owners or buyers. Owners received the information (hard copy, pdf) and buyers receive the initial money amount of 200 CZK. The initial endowment was issued together with instructions. I explained the market procedure to all participants. Experiment had eight market trials. In each trial participants were asked to define their prices (minimum selling price for owners, maximum buying price for buyers). Participants elicited their values using sheets with range of prices ordered from 0 CZK to 300 CZK in steps of 10 CZK. I collected bids and offers and announced the market price for each round. One round was randomly selected to be valid at the end of the experiment. All transactions were made for the market price from that trial. After transactions between owners and buyers have been concluded, final owners of information about candidates read them and wrote a short recommendation for the right candidate.[9] After that they received financial premium of 200CZK. Finally, all participants were provided with the first questionnaire (see appendix).

[9] Students who did not buy information or students who sold information were provided with additional questionnaires. I describe them in sections 5.1.1 and 5.2.1. In the control group all participants were required to answer one of two versions of the questionnaire (see appendix).

Table 1: The Summary of Experimental Design I		
	Experiment	
	Sellers	**Buyers**
Market 1: Induced Value Voucher Market, 8 trials, 1 randomly selected to be valid		
initial condition	voucher	financial amount of 200 CZK
trials	exchange voucher for money	exchange money for voucher
value measure	WTA	WTP
Market 2: Physical Media Information Market, 8 trials, 1 randomly selected to be valid		
initial condition	paper sheet with candidates information	financial amount of 200 CZK
trials	exchange information for money	exchange money for information
value measure	WTA (p)	WTP (p)
Market 3: Virtual Media Information Market, 8 trials, 1 randomly selected to be valid		
initial condition	pdf file with candidates information	financial amount of 200 CZK
trials	exchange information for money	exchange money for information
value measure	WTA(v)	WTP(v)

Table 1: The Summary of experimental design I

Data

I collected the WTA and WTP measures of value from all trials in all markets. Then I took the average of owner's minimum prices and used them as a mean of WTA for each trial. I took the average of buyer's maximum prices and used them as a mean value of WTP for each trial. The results are described in tables 2 and 3. In the first phase I compared WTA and WTP within the markets. In the second phase I compared mean WTA in physical and virtual media information markets. Then I compared mean values of WTP. I used the data with and without extreme values. Two main statistical tests were used – Mann Whitney U-test about the equality of mean values and Wilcoxon rank-sum test.

Prediction 1

The WTA and WTP measures of value given repeated market participation will diverge for the physical media information market because of the higher valuation of information in that case. If the endowment effect is attributable to the physical medium the WTA and WTP disparity would remain statistically significant in the physical media information market. On the contrary the WTA and WTP given repeated market participation will converge for the virtual media

information market. The control-induced value voucher market WTA and WTP measures of value will converge.

Prediction 2

There is a possibility that the WTA and WTP will not converge in the virtual media information market. The study of Daphne R. Raban and Sheizaf Rafaeli revealed an endowment effect also within the market of virtual information. Thus, the proposition 2 deals with the disparity between WTA measures of value in the physical media information market and WTA measures of value in the virtual media information market separately. Based on the fact that the endowment effect is usually experienced by sellers (Kahneman 1979) it is necessary to check whether WTA measures of value are higher in the physical media information market to prove that information are overvalued in that case.

Prediction 3

Prediction 3 states that the mean WTP measures of values would be higher in the group of physical media information buyers, because they seem information more valuable in contrast to virtual media information buyers. So, I estimate that the first group of participants would be more influenced by the quasi-endowment effect and therefore mean WTP will be higher.

Results

Interpretation 1

Table 2A contains results from repeated market trials for all groups before correction for extreme values. Data for all markets show some sort of WTA-WTP disparity possibly caused by the endowment effect. Surprisingly, the widest gap between WTA-WTP measures of value is observable within the last group. But, this is mainly caused by low values of WTP, rather than higher values of WTA. So, we cannot conclude that subjects are less willing to keep the paperback media information which would be against the prediction. As stated below, the endowment effect is usually experienced by sellers. So, the simple fact that buyers would pay less for the information about candidates cannot serve as only evidence of the endowment effect in terms of WTA-WTP disparity. This statement is also underlined by the results of control group WTA-WTP which demonstrates a similar discrepancy. WTA values from the control market with a 200 CZK vouchers are the highest replicating, the lowest transaction costs in the first market where individuals were not required to read the sheet or file with information about candidates, but they just delivered the voucher and got money for it. So, sellers had the lowest motivation to sell it. In conclusion, at first glance the results do not prove that the endowment effect corresponding with the physical media is triggered by the presence of tangible material (paper). Rather, it seems that the disparity in this case is caused by the transaction costs or low motivation of participants to use the information. But what should be noted is the high

variability in WTA values of the third group. For example in the second trial of the virtual media information market the standard deviation is 69.02 CZK in comparison with the standard deviation in the physical media information market of 15.37 CZK. Actually, the high values of WTA in the last group reflect the decisions of three subjects constantly eliciting values of 300 CZK which overlapped extremely low WTA values of others who are willing to relinquish information for 100 CZK, which is the lowest value across all groups. In summary, all WTA-WTP pairs values do not converge, which does not satisfy the prediction. But, due to broad variability of results, I decided to correct for extreme values. Table 2B (after correction for extreme values) is given below. After the correction the highest difference between WTA and WTP is still attributable to virtual media information group. WTA in the control group still reaches highest values in all trials and the lowest WTA values are still attributable to the physical media information market. Finally, the prediction about convergence of WTA-WTP measures of values in the group of subjects who traded an induced value voucher, and in the group of subjects who traded information about candidates in the electronic format is not proved. All WTA-WTP values were significantly different in the final trial. So, although subjects knew the fixed price of voucher or recommendation, sellers had an incentive to overstate the prices especially in the control group. Buyers were also motivated to understate the prices. Low motivation of buyers to buy information about candidates was most probably caused by the fact that ownership of information was coupled with the duty to write a recommendation for candidates, which required mental effort and this effort meant costs. I tried to avoid this by telling participants that people who did not own information got other questionnaire to fill. But, conspicuously, participants did not seem answering questionnaire so costly. Nevertheless, the selling prices were almost never lower than 200 CZK, so participants were not so tempted to spend money for the possibility of avoiding that duty.

Table 2A - The comparison of WTA and WTP measures of value								
value measured	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8
Market 1: induced value voucher market								
WTA	228,89	247,78	226,67	233,33	223,33	224,44	222,22	217,78
	(26,19)	(37,34)	(20,00)	(38,73)	(25,00)	(19,44)	(25,39)	(23,86)
WTP	185,45	192,73	194,55	196,36	194,55	194,55	192,73	167,27
	(35,88)	(19,02)	(20,67)	(17,48)	(16,95)	(15,72)	(15,55)	(64,05)
Mann_Whitney test	3,12***	4,01***	3,51***	2,65**	2,94***	3,72***	3,04***	2,41***
Market 2: physical media information market								
WTA	201,82	201,82	204,55	202,73	200,00	198,18	198,18	205,45
	(17,79)	(15,37)	(23,39)	(12,72)	(12,65)	(7,51)	(9,82)	(31,74)
WTP	160,91	180,91	170,00	161,82	181,82	161,82	158,18	174,55
	(70,06)	(56,29)	(68,99)	(72,22)	(61,78)	(79,22)	(78,97)	(59,05)
Mann_Whitney test	1,87**	1,18	1,57*	1,85**	0,95	1,51*	1,67**	1,53*
Market 3: virtual media information market								
WTA	206,67	200,00	204,17	203,33	198,33	202,50	197,50	200,00
	(65,13)	(69,02)	(66,53)	(66,51)	(61,62)	(58,64)	(61,66)	(59,54)
WTP	107,50	125,83	119,17	136,67	145,00	120,83	160,00	160,83
	(57,86)	(39,65)	(53,16)	(35,76)	(30,30)	(75,13)	(31,62)	(20,65)
Mann_Whitney test	3,94***	3,23***	3,46***	3,06***	2,70***	2,97***	1,87**	2,15***

(1) H0: WTP = WTA, H1: WTP < WTA (3) *** 1% level of significance (5) * 10% level of significance

(2) Ho: WTP = WTA, H1: WTP < WTA (4) ** 5% level of significance

Table 2: The Comparison of WTA-WTP

Table 2B - The comparison of WTA and WTP measures of value (after extreme values correction)								
value measured	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8
Market 1: induced value voucher market								
WTA	227,14	247,14	224,29	228,57	217,14	218,57	215,71	210,00
	(22,15)	(32,00)	(9,76)	(32,37)	(14,96)	(10,69)	(15,12)	(5,77)
WTP	187,78	194,44	195,56	196,67	196,67	197,78	195,56	181,11
	(13,02)	(11,30)	(11,30)	(8,66)	(5,00)	(4,41)	(5,27)	(34,44)
Mann_Whitney test	4,17***	4,16***	5,44***	2,53***	3,47***	4,83***	3,37***	2,47***
Market 2: physical media information market								
WTA	198,89	200,00	207,00	201,11	197,78	197,78	196,67	196,67
	(17,79)	(15,37)	(23,39)	(12,72)	(12,65)	(7,51)	(9,82)	(31,74)
WTP	154,44	183,33	177,78	167,78	196,67	172,22	170,00	188,89
	(53,41)	(30,00)	(31,93)	(41,77)	(25,50)	(66,48)	(64,61)	(7,82)
Mann_Whitney test	2,48***	1,62*	2,22**	2,33***	0,12	1,15	1,23	2,51***
Market 3: virtual media information market								
WTA	208,00	200,00	206,00	204,00	199,00	203,00	197,00	200,00
	(54,32)	(60,00)	(55,42)	(56,41)	(48,18)	(44,48)	(49,23)	(45,95)
WTP	108,00	126,00	124,00	139,00	147,00	126,00	162,00	163,00
	(45,66)	(31,34)	(35,96)	(24,24)	(20,58)	(68,67)	(25,30)	(11,60)
Mann_Whitney test	4,45***	3,45***	3,92***	3,34***	3,13***	2,97***	1,99**	2,47***

(a) H0: WTP = WTA, H1: WTP < WTA (c) *** 1% level of significance (e) * 10% level of significance
(b) Ho: WTP = WTA, H1: WTP < WTA (d) ** 5% level of significance

Table 2: The Comparison of WTA-WTP after correction for extreme values

Interpretation 2

In the second part of statistical analysis I check for possible overvaluation of information on the side of sellers in the Market 2. I compare selling prices of paper version owners with selling prices of pdf version owners. In table 3A prices are described without subtracting extreme values. In table 3B prices are corrected. Using the Mann-Whitney test, the prediction about higher WTA in the Market 2 is not satisfied. Without subtracting extremes the prices are in most trials higher in the physical media information group (but not statistically significant). After extreme value correction the selling prices in the physical media information group are even lower than those in the virtual media information group (but this phenomenon is not statistically significant). But because the WTA values in Market 2 and WTA values in Market 3 are not precisely higher or lower in both directions I decided to use Wilcoxon signed rank-sum test to check whether WTA values in the Market 1 are not higher. But also Wilcoxon test did not reveal any evidence for such statement. So the prediction that people in the Market 2 would value information more because they have the paper hardcopy in their physical possession is not approved.

Table 3A - The comparison of WTA measures of value

value measured	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8
WTA physical media	201,82	201,82	204,55	202,73	200,00	198,18	198,18	205,45
	(17,79)	(15,37)	(23,39)	(12,72)	(12,65)	(7,51)	(9,82)	(31,74)
WTA virtual media	206,67	200,00	204,17	203,33	198,33	202,50	197,50	200,00
	(65,13)	(69,02)	(66,53)	(66,51)	(61,62)	(58,64)	(61,66)	(59,54)
Mann_Whitney test	-0,25	0,09	0,02	-0,03	0,09	-0,25	0,04	0,28

(a) H0: WTA (p) = WTA (v), H1: WTA (p) > WTA (v) (c) ** 5% level of significance

(b) ***1% level of significance (d) * 10% level of significance

Table 3A: the Comparison of WTA measures of value

Table 3B - The comparison of WTA measures of value (after extreme values correction)

value measured	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8
WTA physical media	198,89	200,00	207,00	201,11	197,78	197,78	196,67	196,67
	(6,01)	(7,07)	(23,12)	(9,28)	(8,33)	(6,67)	(7,07)	(5,00)
WTA virtual media	208,00	200,00	206,00	204,00	199,00	203,00	197,00	200,00
	(54,32)	(60,00)	(55,42)	(56,41)	(48,18)	(44,48)	(49,23)	(45,95)
Mann_Whitney test	-0,53	0,00	0,05	-0,16	-0,08	-0,37	-0,02	-0,23

(a) H0: WTA (p) = WTA (v), H1: WTA (p) > WTA (v) (c) ** 5% level of significance

(b) ***1% level of significance (d) * 10% level of significance

Table 3B: the Comparison of WTA measures of value after extreme values correction

Interpretation 3

Previous analysis did not proof significant difference between WTA measures of value of sellers in the physical media information group and WTA measures of value of sellers in virtual media information group, but I found an evidence of such overvaluation on the side of buyers of physical media information. The results might be found in tables 4A and 4B before and after the correction for extreme values. In half of trials values assigned to information by participants in physical media information group are higher than in the virtual media information group which is also valid for WTP after correction for maximum and minimum values. In that case almost all mean values of WTP are higher. Participants in the physical media information group experienced quasi-endowment effect. In contrast to subjects in virtual media information group who did not feel strong motivation for buying information.

Table 4A - The comparison of WTA measures of value

value measured	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8
WTP physical media	160,91	180,91	170,00	161,82	181,82	161,82	158,18	174,55
	(70,06)	(56,29)	(68,99)	(72,22)	(61,78)	(79,22)	(78,97)	(59,05)
WTP virtual media	107,50	125,83	119,17	136,67	145,00	120,83	160,00	160,83
	(57,86)	(39,65)	(53,16)	(35,76)	(30,30)	(75,13)	(31,62)	(20,65)
Mann_Whitney test	1,98**	2,69***	1,97**	1,04	1,79**	1,27	-0,07	0,73

(a) H0: WTP (p) = WTP (v), H1: WTP (p) > WTP (v) (c) ** 5% level of significance

(b) ***1% level of significance (d) * 10% level of significance

Table 4A: The Comparison of WTP measures of value

Table 4B - The comparison of WTA measures of value (after extreme values correction)

value measured	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8
WTP physical media	154,44	183,33	177,78	167,78	196,67	172,22	170,00	188,89
	(53,41)	(30,00)	(31,93)	(41,77)	(25,50)	(66,48)	(64,61)	(7,82)
WTP virtual media	108,00	126,00	124,00	139,00	147,00	126,00	162,00	163,00
	(45,66)	(31,34)	(35,96)	(24,24)	(20,58)	(68,67)	(25,30)	(11,60)
Mann_Whitney test	2,02**	4,07***	3,45***	1,81**	4,64***	1,48*	0,34	5,75***

(a) H0: WTP (p) = WTP (v), H1: WTP (p) > WTP (v) (c) ** 5% level of significance

(b) ***1% level of significance (d) * 10% level of significance

Table 4B: The Comparison of WTP measures of value (after extreme values correction)

3.1.3 Method II

Participants

The same 66 students like in the previous experiment participated in the second part of experiment. They were randomly assigned into three groups – choosers[10], owners #1 and owners #2. The assignment was the same like in the previous experimental session.

Procedure

Control group – Choosers

Subjects in the group of choosers were asked to decide between three pairs of goods – a coffee mug or chocolate (control goods), paperback version of Jak drahé je zdarma (Predictably Irrational) by Dan Ariely or paperback version of Škobrtnout o štěstí (Stumbling on Happiness) by Daniel Gilbert[11] (treatment goods 1) and the pdf version of the same books (treatment goods 2). I consequently distributed all items to students and let them examine them. First, I gave all participants choice between the first pair of goods (mug and chocolate). The choice between the second and third pair of goods was offered to two different groups of participants. A second pair of goods (paperback version of the two books) was offered to people who were previously assigned to the group of buyers and the choice between the third pair of goods (pdf version of these books) was offered to people who were previously assigned to the group of sellers (see table 5). Each participant was required to note her choice between control and one pair of treatment goods on a piece of paper. [12] Each pair of goods was given to two participants who were selected randomly.

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[10] Choosers – control group, owners #1– physical media information group, owners #2– virtual media information group.

[11] I chose these two books because they both have catchy names, so they might seem interesting for participants. They also have approximately the same number of pages and similar price. I conducted one pilot study in Dvorakovo gymnasium in Kralupy nad Vltavou to check whether one of the books is more preferred by students. I presented them to 30 students with the mean age of 17.5 and asked to them to choose the book they preferred. 58% of them chose Jak drahé je zdarma (Predictably Irrational). Thus, the preferences for both groups should be nearly balanced.

[12] I denote the choice and endowed criteria in different terms. On the piece of paper in the choice condition I write the following: "Option 1: I want *item 1.* Option 2: I want *item 2".* In the treatment condition I write: "Option 1: I want to keep *item 1*. Option 2: I want to exchange *item 1* for *item 2".*

Treatment groups – owners

Subjects in two groups of owners were consequently endowed with one good from each pair. First I told all participants that they owned one of the control goods (mug for the first group and chocolate for the second group). Then I presented the item too them and let them examine it. After that, I told them that they had an opportunity to exchange that good for the second good from pair and this good was again issued to them. Then each student marked her choice on the piece of paper. Only two participants for each pair of goods were randomly selected to obtain them. Next, I divided participants into two groups and said to them that they owned the endowed book and that one group had it in pdf version and the second group had it in the paperback version (see table 5). Again I asked them to examine the first book and then provided them with the second book. Each participant was required to note her choice between control and treatment goods on a piece of paper. Each pair of goods was given to two participants who were selected randomly.

Table 5: The Summary of Experimental design II

		item 1	**item 2**
Group 1: Choosers, 3 pairs of items			
Choice 1	n=20	coffe mug	chocolate
Choice 2	n=9	paperback book 1	paperback book 2
Choice 3	n=11	pdf book 1	pdf book 2
Group 2: Owners #1, 3 pairs of items			
Exchange 1:	n=22	**coffe mug**	chocolate
Exchange 2:	n=12	**pdf D.A.**	pdf D.G.
Exchange 3:	n=10	**paperback D.A.**	paperback D.G
Group 3: Owners #2 , 3 pair of items			
Exchange 1:	n=24	coffe mug	**chocolate**
Exchange 2:	n=12	pdf D.A.	**pdf book D.G.**
Exchange 3:	n=12	paperback D.A.	**paperback D.G.**

i) D.A. - Jak drahe je zdarma by D. Ariely, D.G. Škobrtnout o štěstí by D. Gilbert
ii) endowed good = **underlined**

Table 5: the Summary of experimental design II

Data

I collected choices of each participant (one participant – two decisions), summarized them, described in terms of relative proportions and compared differences by the Goodness of Fit Test.

I defined results in terms of proportions of final owners of each good. So, the differences might be easily observed at first glance. Simply, if the endowment effect does not exist at all, the relative proportions in each column is supposed to be the same.

Prediction 1

I use two control goods – coffee mug and chocolate – items typically involved in endowment effect experimental testing. The prediction states that relative shares of final owners in each group would be different. If the endowment positively affects individual's preferences I expect that more owners will keep their endowment. Thus, the frequency of subjects who decide, for example, to keep the mug would differ in the group of choosers, owners #1 and owners #2.

Prediction 2

I expect that preferences of owners of the pdf version of books will not be positively influenced by the endowment effect due to lack of the physical contact. So, the number of subjects who keep the endowed book would be equal or lower than the number of subjects who chose that book under the control condition.

Prediction 3

If the endowment effect is triggered by physical contact, I estimate that preferences of individuals would be positively affected on behalf to the endowed book. So, the number of subjects who keep the endowed book would be higher than the number of subjects who chose that book under the control condition.

Results

Interpretation 1

The results proved the prediction about the effect of ownership on the willingness to exchange the item. Participants in the first group of choosers did not seem to view the possibility of having the coffee mug very attractive. Only 20% of them voted for the mug and the rest of them preferred chocolate. The same was valid for the group of participants who were not initially endowed with the mug. In that group 21% preferred it. But in the group of participants who were firstly referred as owners of the mug and were able to exchange it for the chocolate 32% of participants decided to keep the mug satisfying the statement about their lower willingness to sacrifice it. [13] Goodness of Fit Test revealed a statistically significant difference between the

[13] Participants sacrifice only the opportunity to have the mug. One subject is randomly selected to get the mug after the experiment finishes. Even though subject are less willing to exchange it.

relative proportions of owners in the choice group and groups of owners #1 and #2 on the 5% level of significance with χ^2=23.15.

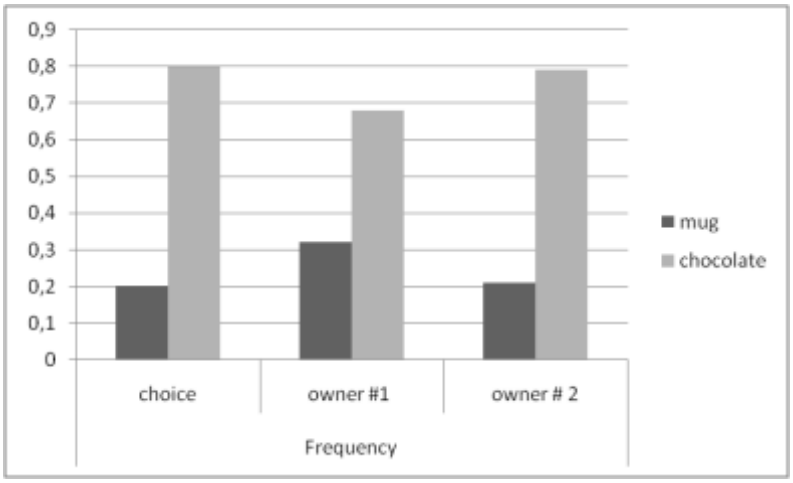

Table #6: Frequency of the mug final owners under the choice condition (people who chose between mug and chocolate), owner condition 1 (people who initially owned the mug), and owner condition 2 (people who initially owned the chocolate)

Interpretation 2

Due to random assignment the frequency of owners of each book is supposed to be the same and it should mirror the frequency of owners in the control-choice group. Otherwise, it might serves as an evidence of endowment effect. Brief look at the table #7 shows that ownership of the pdf version of the first book (D.A. Jak drahé je zdarma) affected the motivation to keep that book in a negative way. Actually, fewer people wanted to keep the endowment in both ownership groups. 55% of students chose the first book in the control group and only 50% of participants who were referred as initial owners kept it. This disparity is statistically significant on the 5% level of significance according to the Goodness of Fit test with χ^2=6.28. In the group # 2 participants who were referred as initial owners of the second book (D.G. Škobrtnout o štěstí) 84% decided to exchange it for the first book. So there was an evidence of some kind of reverse endowment effect. Once a person was endowed with electronic version of the book she had a higher incentive to exchange it for another without experiencing the pain of loss. The possible explanation is that the pdf file is easy to copy, so an individual is motivated to change it, because she does not experience the negative feeling of loss. This finding might serve as on of the explanations of frequent infringement of property rights to virtual media like movies or MP3 files. Nevertheless, further research is needed.

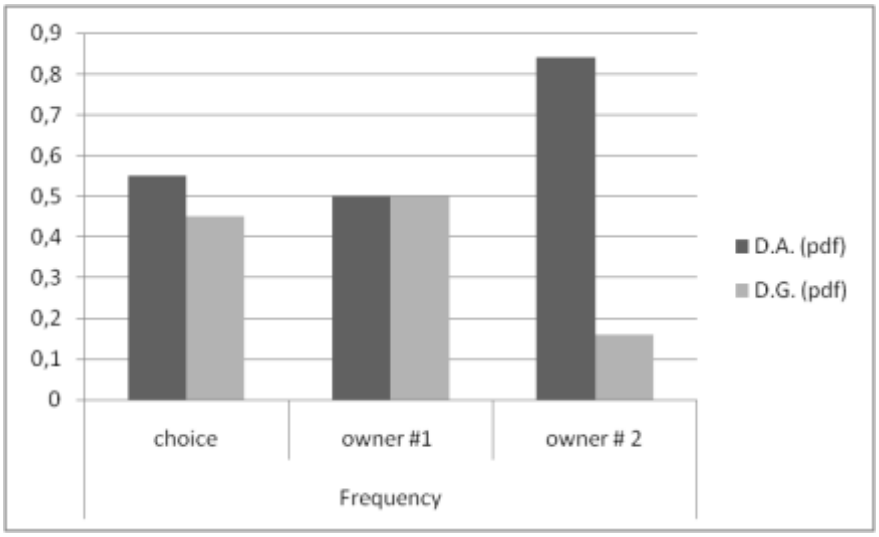

Table #7: Frequency of the first final book owners (D.A. pdf) under the choice condition (people who chose between two books), owner condition 1 (people who initially owned the first book – D.A. pdf), and owner condition 2 (people who initially owned the second book – D.G. pdf)

Interpretation 3

According to table #8 the proportion of final owners is different in each group. Only 45% of subjects chose the first book (D.A. Jak drahé je zdarma) in the control group suggesting that it was the less preferred book. In contrast to 70% of participants who were initially endowed with that book and kept it. The difference in relative proportions between choice and owners groups is statistically significant on 5% level based on the Goodness of Fit test with χ^2=6.35. So the prediction about the effect of physical possession associated with physical medium was proved. People who were holding the book for a while became instantly attached to it and had higher probability to keep it, which is in accordance to the theory of positive physical possession effect.

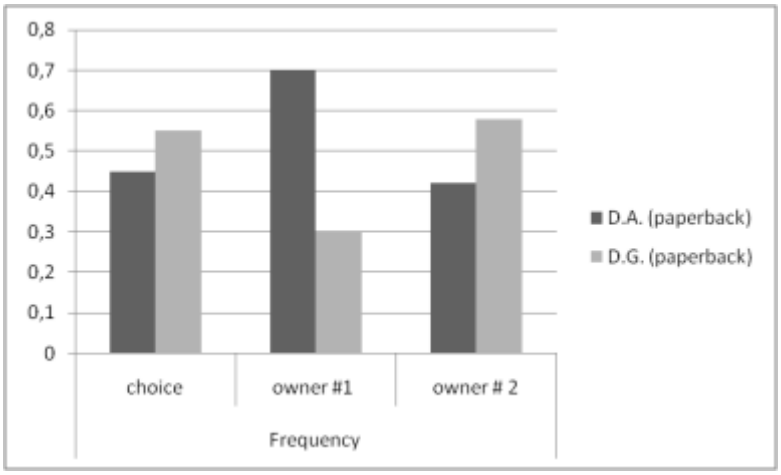

Table #8: Frequency of the first final book owners (D.A. paperback) under the choice condition (people who chose between two books), owner condition 1 (people who initially owned the first book – D.A. paperback), and owner condition 2 (people who initially owned the second book – D.G. paperback)

3.1.4 Method III

The last experiment is designed to find control variables for the physical and virtual media information markets.

Procedure

The last part of the experiment is a single-trial sealed bid auction of hand-embroidered T-shirt. Participants were asked to record their bids on the piece of paper. The subject with the highest bid won the auction. She paid the recorded price and got the T-shirt. The auction is conducted within two control groups and not in the control group, because data about participant's bids for T-shirts are needed only for analysis of subject's WTP for information about candidates in treatments groups and not for WTP for control voucher.

Data

The bids for hand-embroidered T-shirts of each participant are used for the regression analysis as an explanatory variable for participant's WTA and WTP for information. The regression analysis can be found in the following section.

Prediction 1

I expect that the regression analysis reveals a positive relationship between the bid for the hand-embroidered T-shirt and the WTP for the hardcopy of information about candidates within the physical media information group. Otherwise, the bid for the hand-embroidered T-shirt is supposed to be negatively correlated with WTP for the pdf version within the virtual media information group. The thought process for my expectation is the following. The fact that participants might be more willing to pay for the hardcopy possibly demonstrates they appreciate that somebody decided to print them. So, let's say they value the human factor of the production, which is the link with bids for the hand-embroidered T-shirt associated with higher human factor engagement. This prediction is also connected with the fact that people are often more willing to pay for ethically produced goods, like fair trade coffee (Trudel, Cotte 2009).

4.1.1. WTA-WTP in Physical and Virtual Media Information Group – Regression Analysis

In this section I want to compare WTA and WTP in the physical and virtual media information group separately to whether the tested variables influence the individual's WTA and WTP in a different way, if information from different media is traded. So I have four regression instances – two for WTA and two for WTP.

Data

Data come from the questionnaire that participants answer during the experimental session. I get information about the subject's gender, age, town, family income, individual income and personal characteristics such as perceived happiness, curiosity and materialism. I also ask about the participant's relationship to virtual and paper information media. So, I know how many books each person reads in the paperback version and how many of books she reads in a virtual version (MOBI, Pdf). I also find out if an individual prefers to print text rather than read it from the computer screen. Then I have information about whether each participant has ever written a love letter, or whether she sends correspondence or birthdays greetings via surface mail. The last variable I use is the real willingness to pay for the T-shirt described above.

Data description

In the first case I have only 11 observations in the physical media information group and 12 observations in the virtual media information group, so the number of involved explanatory variables is limited. I use explanation variables WTA **ln(WTA$_p$), ln(WTA$_v$)** and WTP **ln(WTP$_p$), ln(WTP$_v$)**[14] in logarithmic terms, because they cannot be lower than zero, so they are not normally distributed. I decide to employ a binary variable of **gender** (woman=1, men=0), dummy variable of personal income – **perIn** (less than 2500 CZK=**lowest_perIn**, 2501-5000 CZK=**low_perIn**, 5001-7500 CZK=**middle_perIn**, 7501-10000 CZK=**high_perIn**, more than 10001 CZK=**highest_perIn**), **hapiness** (self reported happiness on the scale from unhappy=1, very happy=7), **curiosity**[15] (self reported curiosity on the scale from 1 to 7, not curious=1, very curious=7), **materialism**[16] (self reported materialism on the scale from 1 to 7, not

[14] WTA [WTP] for each participant is the mean value of her WTA [WTP] from all trials.

[15] The variable **curiosity** results from three questions. Firstly, if subject likes to try new activities and new stuff. Secondly, if she always tries get as much information as possible about new situation. Finally, if she is focused on the activity that she does (Kashdan et al 2004). I make an average from answers of each participant (all elicited on the scale from 1 to 7).

[16] The variable **materialism** is based on three questions. Participant first reports whether she admires people who own luxury goods. Than she answers whether she loves to buy new things and if she would be

materialistic=1, very materialistic=7) and WTP for the T-shirt – **t-shirt (CZK).** I do not use the **age** variable, because all participants are approximately the same age. From the choice of family income and personal income I chose personal income which, I estimate, has more significant impact on the WTA and WTP. I also get rid off the variable describing the place where participant lives, because the variability is low and almost all participants live in towns of similar sizes. From the variables describing the individual's relationship to paper media I choose the binary variable **love_letter** (write love letter on the paper=1, never write love letter on paper=0).

Data correction

I needed only two corrections of the data set. First, in the group of buyers in Market 2, there was nobody in the lowest category of personal income. So the first category is the **low_perIn**. Secondly, there was one subject in the same group who rejected to report her perceived level of happiness, so I replaced it with the mean value of the other answers.

Descriptive Statistics

Table 9: Descriptive Statistics of Explanatory Variables

Market 2: Physical Media Information							
WTA	201,59	Curiosity	4,91	WTP	168,75	Curiosity	5,55
	(15,31)		(1,05)		(47,18)		(0,69)
Gender	0,18	Materialis	3,61	Gender	0,27	Materialism	3,91
	(0,40)		(0,98)		(0,47)		(1,06)
PerIn	2,82	Love_lette	0,82	PerIn	3,18	Love_letter	0,55
	(1,08)		(0,82)		(1,33)		(0,52)
Hapiness	4,91	T-shirt	19,09	Hapiness	5,64	T-shirt	29,64
	(1,04)		(13,75)		(1,03)		(37,65)
Market 3: Virtual Media Information							
WTA	201,56	Curiosity	5,75	WTP	134,48	Curiosity	5,39
	(60,27)		(0,32)		(34,94)		(0,86)
Gender	0,42	Materialis	3,67	Gender	0,17	Materialism	3,89
	(0,51)		(1,33)		(0,39)		(1,32)
PerIn	3,58	Love_lette	0,50	PerIn	3,33	Love_letter	0,67
	(1,38)		(0,52)		(1,50)		(0,49)
Hapiness	5,42	T-shirt	20,00	Hapiness	5,08	T-shirt	49,17
	(1,16)		(32,75)		(1,16)		(51,43)

a) mean value + (standard deviation)

Table #9: Descriptive Statistics

Operational Model I

In equations describing the WTA for paper version of the information about candidates and WTA for the virtual version of the information about candidates I use variables gender, personal income, happiness, curiosity, materialism, t-shirt, and love letter. WTA and WTP are in logarithmic terms. So, the first equation is:

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happier if she owns more stuff (Richins, Dawson 1992). I take an average of answers for all three questions (all elicited on the scale from 1 to 7).

(1)

$$\ln(\mathrm{WTA_p}) = \beta_0 + \beta_1 gender_i + \beta_2 perIn_i + \beta_3 happiness_i + \beta_4 curiosity_i + \beta_5 materialism_i + \beta_6 tshirt_i + \beta_7 loveletter_i + u_i$$

i=1 to 11

I estimate that women would require being paid more money to sell the paper version of information about candidates, because women are commonly more sentimental than men, so they get attached to items more easily than men (Croson et al. 2009). The level of personal income might affect the WTA in two different ways. A person with higher income might require more money, because she has a different perception of prices. The second possibility is that she requires less money, because she does not have to take care of her budget. According to Jennifer Lerner et al. (2004) theory mentioned in the section 1.1.5 I expect that higher level of perceived happiness would increase selling prices, because a happy person gets quickly emotionally involved in the ownership of an object. The characteristic of curiosity is supposed to affect WTA in a negative way, because a person who is more curious might be interested in selling information to see how the transaction would be done (or to see the second questionnaire). Based on the theory of Inge Lens a person with stronger materialistic attitudes would be willing to sell her endowment for higher prices, because she appreciates ownership of goods more (Lens 2009). I include the variable t-shirt to see whether a person who is willing to pay more for the hand-embroidered t-shirt would require more money for selling her endowment as I describe in the section 3.1.4. The last variable is a binary variable of love letter. I expect a positive sign of the estimated parameter, because an individual who writes love letters in the old fashioned way on paper would have positive relationship to traditional paper media, so again she could become more emotionally involved in owning the paper version of the candidates information.

The second equation estimating WTA measures of value in the virtual media information group has the same variables as the first one. I use the same variables to see, whether they influence WTA in physical and virtual group differently. If physical possession of the item (paper version of information) does not influence the endowment effect and thus personal selling decisions, the impact of involved variables should have the same direction and similar magnitude. So, the second equation is:

(2)

$$\ln(\mathrm{WTA_v}) = \beta_0 + \beta_1 gender_i + \beta_2 perIn_i + \beta_3 happiness_i + \beta_4 curiosity_i + \beta_5 materialism_i + \beta_6 tshirt_i + \beta_7 loveletter_i + u_i$$

i=1 to 12

Operational Model II

In equations describing WTP of participants in two treatment groups I use the same explanatory variables as in the WTA equations. I decide to use the same variables because characteristics I have like happiness or materialistic attitudes influence both prices – selling and buying. Then the third equation is:

(3)

$$\ln(\mathrm{WTP_p}) = \beta_0 + \beta_1 gender_i + \beta_2 perIn_i + \beta_3 happiness_i + \beta_4 curiosity_i + \beta_5 materialism_i + \beta_6 tshirt_i + \beta_7 loveletter_i + u_i$$

i= 1 to 9

In this case gender is used as a control variable. Then I expect positive impact of personal income on buying prices. Characteristic of happiness is supposed to have a negative sign, because a happy person does not want to buy new good, since she is satisfied with her current situation or endowment (Lerner et al. 2004). I estimate that variable curiosity would have a positive sign; a person who is more curious would be tempted to buy information about candidates more than the less curious person. Stronger materialistic attitudes are supposed to increase buying prices, because a materialistic person enjoys buying new things and unnecessary items, so the sign should be positive (Lens 2004). The t-shirt variable should have a positive impact as I describe above. Finally, I expect that a person who writes love letters on paper would be more willing to buy the paper version of the information like in the previous case.

The last equation is the WTP of participants in the group trading virtual information. I use the same strategy as in the operational model II. So, first I estimate that all variables are supposed to have a similar impact on the WTP, and if it is not so, this fact represents additional evidence for the importance of of the physical possession of the item on the magnitude of the endowment effect (participants know that they would not have the sheets with information about candidates in physical possession, even if they buy them). The fourth equation is:

(4)

$$\ln(\mathrm{WTP_v}) = \beta_0 + \beta_1 gender_i + \beta_2 perIn_i + \beta_3 happiness_i + \beta_4 curiosity_i + \beta_5 materialism_i + \beta_6 tshirt_i + \beta_7 loveletter_i + u_i$$

i= 1 to 12

Results

Table 10: OLS Results

Estimated coefficients with t-statistics

Market 2: Physical Media Information

ln(WTAp)				**ln(WTPp)**			
Constant	5,93	Curiosity	-0,14	Constant	5,77	Curiosity	0,15
	(3,32)		-(0,59)		(1,14)		(0,18)
Gender	0,04	Materialism	0,17	Gender	0,13	Materialism	-0,22
	(0,14)		(0,57)		(0,09)		-(0,34)
PerIn		Love_letter	0,09	PerIn		Love_letter	-0,42
			(0,28)				-(0,37)
low_perIn	0,03	T-shirt	-0,01	low_perIn	x	T-shirt	0,00
	(0,09)		-(0,39)		x		(0,03)
middle_perIn	0,10			middle_perIn	0,18		
	(0,34)				(0,12)		
high_perIn	0,06			high_perIn	-0,11		
	(0,12)				-(0,07)		
highest_perIn	0,04			highest_perIn	-0,60		
	(0,10)				-(0,27)		
Happiness	-0,07			Happiness	-0,07		
	-(0,48)				-(0,08)		
Coefficient of determination:			0,58	Coefficient of determination:			0,64

Market 3: Virtual Media Information

ln(WTAv)				**ln(WTPv)**			
Constant	5,54	Curiosity	-0,01	Constant	6,22	Curiosity	-0,14
	(1,13)		(0,02)		(3,71)*		-(0,46)
Gender	0,52	Materialism	0,01	Gender	-0,15	Materialism	-0,10
	(0,88)		(0,09)		-(0,37)		-(0,69)
PerIn		Love_letter	-0,16	PerIn		Love_letter	-0,02
			-(0,28)				-(0,03)
low_perIn	-0,22	T-shirt	0	low_perIn	0,89	T-shirt	0,00
	-(0,30)		(0,12)		(1,10)		(1,15)
middle_perIn	0,11			middle_perIn	0,94		
	(0,79)				(1,07)		
high_perIn	0,14			high_perIn	1,12		
	(0,19)				(0,85)		
highest_perIn	-0,16			highest_perIn	1,52		
	-(0,20)				(1,10)		
Happiness	-0,11			Hapiness	-0,23		
	(0,17)						
Coefficient of determination:			0,82	Coefficient of determination:			0,68

a) *** 1% level of significance
b) ** 5% level of significance
c) * 10% level of significance
d) Reference variable Market 2, WTA: lowest_perIn
e) Reference variable Market 2, WTP: low_perIn
f) Reference variable Market 3, WTA: lowest_perIn
g) Reference variable Market 3, WTP: lowest_perIn

Table #10: The OLS Results

Interpretation of Results

Neither variable appears to be significant, but I use these coefficients because the regression analysis is mainly utilised to compare the influence of the same explanatory variable on WTA [WTP] in the groups of physical and virtual media information.

First, I compare the results for owners in both groups. Clearly women require more to sacrifice their endowment no matter what it is. Different levels of personal income bring a very unstable response, so the ability to explain is limited. The sign of the coefficient of personal happiness is negative, so happier participants were more willing to sacrifice their endowment. This does not satisfy the prediction that a happier person is more likely to get attached to their ownership. The characteristic curiosity has expected result. More curious individuals would be more likely to sell their endowment possibly to take part in the exchange procedure, which is new for them. Materialism also influences WTA in the predicted direction. More materialistic participants appreciate their endowment more. This effect is stronger for owners of physical version information. The love letter variable has a different sign in Market 2 than it does in Market 3. It appears with positive sign in the group of paper sheet owners and with negative sign in the group of pdf file owners, satisfying the prediction that individual who writes love letters on paper, value the paper sheet more and pdf file less. The effect of the t-shirt variable is almost equal to zero. Although, results are not robust, these findings provide other evidence of the role of personal characteristics in market behaviour. In both markets women and more materialistic people were less willing to relinquish their endowment and more curious person were more eager to do it.

Secondly, I interpret results for the subgroups of buyers in both groups. Women in the group of buyers of the paper version of information are willing to pay more in contrast with the buyers of the pdf version of information. This corresponds to the prediction. The effect of increasing personal income is again mixed, possibly because the initial financial amount that participants get for transactions is low. The effect of perceived happiness goes in expected direction. So a person who is content with her current status (endowment – initial money amount) does not have a motivation to change it (by buying a new item – information about candidates). The effect of subject's materialistic manners is the same in both groups contradicting the prediction about higher buying prices of more materialistic people. This is possibly caused by the fact that these participants prefer to keep the money to buy a new item outside of the laboratory, rather than exchange it for the item traded inside the laboratory (information about candidates). The effect of the love letter variable does not follow the expected direction and the effect of the variable describing how much money the subject is willing to spend for the t-shirt is almost equal to zero, but positive.

5.1.1 Hypothetical WTA-WTP Measures of the Value of Information

This part of my study is focused on further testing of the effect of loss aversion on the subjective value of information as an addition to previous experimental testing of the endowment effect of information from Raban-Sheizaf. The WTA-WTP measures of value come from the questionnaire which contains questions similar to the ones described in the section 1.2.3. Each question has two variations. In the first version the participant is presented as a buyer of the information. In the second version she is set up in the role of an information owner. So, for example, I ask for the participant's willingness to pay as a consumer to get additional information about the origin of the beef meat (written on the wrapper). Then I ask about the participant's willingness to accept compensation[17] in case she is not able to acquire that information (not written on the wrapper). I use questions about the commonly consumed products like coffee or a baguette.[18] The questions are following:

Question #1A: *How much more would you be willing to pay for the baguette with additional information about the calories on the wrapper?*
Question #1B: *How much less would you expect to pay for the baguette without information about the calories?*

Question #2A: *How much more would you be willing to pay for the medicine with additional information about the alcohol content on the wrapper?*
Question #2B: *How much less would you expect to pay for the medicine without information about the alcohol content on the wrappage?*

Question #3A: *How much more would you be willing to pay for the bottle of mineral water with information about the mineral content on the wrapper?*
Question #3B: *How much less would you expect to pay for the bottle of mineral water without information about the mineral content on the wrapper?*

Question #4A: *How much more would you be willing to pay for the coffee with information about the country of origins written on the wrapper?*
Question #4B: *How much less would you expect to pay for the coffee without information about the country of origins written on the wrapper?*

Question #5A: *How much more would you be willing to pay for the meat with additional information about the country of origins written on the wrapper?*
Question #5B: *How much less would you expect to pay for the meat without information about the country of origin?*

[17] The compensation comes in the form of lower price of the good.

[18] Usually the wrappage of the good already contains the information. So a person acts as an owner of the information.

Participants

The sample of 42 subjects from 66 students participating in the experiment answered the questionnaire. It was distributed to 20 participants from the control group and to 10 and 12 of subjects in two treatment groups.

Data

I average elicited hypothetical values of all participants and compare them using Mann-Whitney statistical test.

Prediction 1

An individual's willingness to pay for an additional piece of information would be lower than her willingness to accept compensation for a missing piece of information. If people feel the potential loss of information negatively they require higher compensation.

Results

Results can be found in the table 11. Except for the additional information about the mineral water, are all WTA significantly higher than the corresponding WTP ones at 1% level of significance. Participants require the highest compensation for missing information about the country of origins of meat probably because they perceive this information to be very important for purchasing these types of goods, because it is an important signal of their quality. So, the prediction about WTA-WTP disparity values is accepted. WTA exceeds WTP in almost all cases suggesting that an individual experiences a negative feeling from potential loss of the piece of information. [19] This statement contrasts with the evidence of the lack of loss aversion in case of virtual media information from the section 3.1.3. Because all questions about subject's WTP and WTA for additional information were concerned on real product's characteristics, it might serve as another confirmation of the positive effect of physical media information on the endowment effect.

[19] But these results might be overstated, because the negative feeling from loss of a piece of information includes not only loss aversion, but it also captures risk aversion and aversion to uncertainty, because framing of questions possibly made participants to anticipate that good with missing information had lower quality. Therefore its purchase would be more risky and brings uncertain satisfaction.

Table 11: Hypothetical WTA and WTP for additional information			
good (+ information)	WTP (CZK)	good (- information)	WTA (CZK)
Baguette (+)	1,00	Baguette (-)	3,89
st. dev.	(2,03)	st. dev.	(5,12)
Mann-Whitney Test: 3,40***			
Medicine (+)	3,50	Medicine (-)	9,80
st. dev.	(8,38)	st. dev.	(15,16)
Mann-Whitney Test: 2,36***			
Water (+)	1,97	Water (-)	3,16
st. dev.	(3,49)	st. dev.	(3,56)
Mann-Whitney Test: 1,56*			
Coffee (+)	5,54	Coffee (-)	10,23
st. dev.	(7,18)	st. dev.	(12,75)
Mann_whitney Test: 2,43***			
Meat (+)	7,60	Meat (+)	16,48
st. dev.	(6,81)	st. dev.	(16,28)
Mann-Whitney Test: 3,26***			

a) *** 1% level of significance

b) ** 5% level of significance

c) * 10% level of significance

Table #11: Hypothetical WTA and WTP for additional information

5.2.1. Information and different media – Do we trust information from books more?

In the second part of the questionnaire I focuse on the subjective quality of information. I define quality of information in terms of trustworthiness. So, I want to learn whether people believe information more from books rather than online. The questionnaire has two versions. Both versions include the same pieces of information, but they have different references. In the first version I state that the information comes from the book and in the second version I state that the information is available online and note the link. Participants are required to mark how much they trust the information on a scale of 0% - Absolutely not trust 100% - Absolute trust in increments of 10%. Each participant has only one version of the questionnaire. Information I use is vague and actually not very trustworthy. I want to know if use of a book reference might improve the perceived „quality“ of the information. I use the three pieces of information noted below, either as a book reference or an internet link.

Information #1: *American government have played role in planning attacks on WTO from 11th September 2001.* [Reference: Hecker, Robert. (2002): America in War, ISBN 80-204-0105-9] or [Reference: Hecker, Robert. (2002): America in War, (available online: www.americainwar.us)]

Information #2: *Thanks to using creditcard payment citizens are easily monitored by the government.* [Reference: Schubert, James. (2005): Credit Card Bias, ISBN 50-6050785-6] or [Reference: Schubert, Jamse. (2005): Credit Card Bias, (available online: www.jamesschubert.com]

Information #3: *One reason producers add fluorid in the dental paste is to make people more docile.* [Reference: Kubaczek, Peter: (2006): Fluorid and Docility, ISBN 80-401-0569-2] or [Reference: Kubaczek, Peter: (2006): Fluorid and Docility, (available online: www.fluoridtheory.com]

Participants

The sample of 42 subjects from 66 students participating in the experiment answered the questionnaire. 22 individuals got the first version with book references and 20 students received the second version with online references.

Data

I took an averages of elicited values defining each subject's perceived trustworthiness of the information. I manage the answer separately for each piece of information and compare them across the book reference group and online reference group.

Prediction 1

Let me return to Jostman's weight theory which shows how experiencing weight affects an individual's decisions. Heavy objects like books make people to judge issues to be more important. I estimate that the first reason of higher trustworthiness of information from books is the link between weight theory, importance and thus trustworthiness. The second reason is the common knowledge that the production of books is longer and involves control of many people which makes information from them trustworthier. The production of online information does not require any control and it is almost costless. So, I expect that information with book reference would have higher average trustworthiness than information using online reference.

Interpretation 1

In all cases participants believe information more if it uses a book reference, even if they do not know the book or it's author.[20] But the difference turns out to be statistically significant in only one case. Individuals trust information about fluorid and docility with a book reference significantly more (23%) than people in second group believe the same information with an online reference (7%) . The reason why the most greates impact is documented in this case might be that the speculation about connection of fluorid and docility is not familiar and new. So, the conclucion could simply be that a person judges new information more critically and is more interested in its origin. Nevertheless, the influence of a book reference on perceived trustworthiness is undoubtedly observable in all three cases. People trust information from books more than internet sources.

Table 12: Trustworthiness of information

	book reference (%)	online reference (%)
WTO	42,73	39,25
st. dev.	(27,46)	(25,15)
Mann-Whitney Test: 0,42		
Credit Card	70,45	61,25
st. dev.	(27,86)	(26,85)
Mann-Whitney Test: 1,09		
Fluorid	22,73	7,00
st. dev.	(27,63)	(14,18)
Mann-Whitney Test: 2,35***		

a) *** 1% level of significance

b) ** 5% level of significance

c) * 1% level of significance

Table #12: Trustworthiness of information

Conclusion

The study focused on individual's hypothetical WTA and WTP values given in the section 5.1.1 demonstrated that participants treated information like any other goods, so people felt the disutility from loosing additional piece of the information more strongly than the utility of gaining additional piece of the information. So the theorem of loss aversion is linked with information too. The last study proved that people believed more information from books rather than information available online. The first experimental procedure did not reveal stable evidence for the association of the endowment effect and physical media information. The disparity between WTA of sellers and WTP of buyers was observed in all groups including

[20] The book is fiction same like its author.

control. So, the some sort of the endowment effect was present in each group no matter what was traded. Also selling prices were nearly equal in both groups. While I did not find an evidence of endowment effect on the side of owners I found strong evidence for quasi-endowmentt effect on the side of buyers. Subjects assigned higher monetary value to information from physical media and WTP values were significantly higher in that group. Although regression analysis prove some expectations about effects of some personal characteristics like curiosity or perceived level of hapiness on participants WTA and WTP measures of value, the results were not significant and stable. The most striking difference between the physical and virtual media information markets was the effect of materialistic attitudes of individuals. More materialistic individuals valued information more, but that effect was stronger for owners of information from physical media. Regression analysis did not find any effect of participant's WTP for hand-embroidered t-shirt on the WTA and WTP measures of value. Nevertheless, the second experimental procedure based on the comparison of willigness to exchange exposed a weak evidence on behalf of the hypothesis. Participants who were endowed with the hardback version of one book were less willing to exchange it for the other. This result reflects the fact that once a person had a physical contact with the book she was more eager to keep it. So, the touch is the important trigger for establishing subjective feeling of ownership and therefore leads to stronger reluctance to religuish the item. This conclusion is in accordance with previous studies of the endowment effect. In addition, it provides new overlook on the possession effect, because researches in earlier studies usually distinguished between treatment group with physical possession and control group without physical possession by not allowing subjects to examine the good (Reb, Conolly 2007), (Knetsch, Wei-Kang Wong 2009), (Wolf et al. 2007). In this experiment all participants were able to examine goods. The only difference was that participants could touch the book in paper version and the pdf version was available only on the computer screen.

Implications

The effect of instant quasi-endowment effect amplified by physical possession is widely used marketing strategy. It cames in forms of free samples, free rides or free vouchers. For example, before an individual gets – let's say – free sample of chocolate bar, she would not consider purchasing this chocolate very attractive, because buying it brought her only tepid feeling of gain and strong painful feeling of spending money. But once a person gets a free sample of chocolate and have an opportunity to try it, suddenly starts to value it like the owner and therefore she is more willing to pay for it. Similar example is a free car ride for potential customers provided by car dealers. As soon as a client gets an opportunity to try the car, she becomes attached to it and potentially more willing to buy that car, because the decision of not buying would be

accompanied by negative feeling of loss. Because this effect is stronger for more materialistic people advertisment might be concerned on highlighting good's characteristics like luxury and uniqueness, rather than on temperance and usefulness that are characteristics preferred by less materialistic individuals.

The evidence of lower WTP for virtual information might shed some light on the high frequency of software piracy, because people do not feel the duty of paying for something which is available online. For example, the willigness to pay for the pdf format of research articles by students via internet would be exceedingly low than their willigness to pay for the same article in paper version. So without free databases like J-store or EconLit the spread of information would be limited. It can also explains the low motivation of computer users to pay for sofware resulting in high spread of sofware piracy.

Discussion

The effect of the haptic experience associated with the book to reader on her subjective feeling of ownership need to be further tested. In this experiment participant had only short time for examining the book. I issued books to them only for a short time, because I had only limited number of books. The fact that only two few participants finally received the book could also weaken their perception of ownership.

The impossibility of finding an evidence of the endowment effect in the first experimental procedure was probably caused by the lack of the motivation for buying or keeping information about candidates, because it was connected with high transaction costs - the duty of elaborating the recommedation for the right candidate which required some mental effort. The fact that the I used fixed financial reward for that recommedation resulted in small differenced between elicited values, but I decided to use this reward rather than uncertain outcome, because the endowment effect was previously observed in association with exchange good with uncertain outcomes, so the disparity of WTA-WTP would not be an evidence of endowment effect triggered only by the physical possession (Van de Ven et al. 2005). Also the control market with induced value voucher migh be improved by using the virtual version of the voucher that would be traded by subjects in order to get two control groups – one for each treatment group. The data from control group in my experiment are more compatible for comparison with the physical media information group than with the second group.

Because the sample of subjects was composed from University students the results of high motivation to exchange virtual information and low enthusiasm to pay for them were distorted because students are used to share illegal sofware from peer-to-peer networks. According to data of BSA Global Software Piracy Study 45% of Czech inhabitants reffer that they aquire illegal software via peer-to-peer networks (BSA 2010). So future testing could cover differences in the

endowment effect and information from regular and virtual media for distinct age groups.

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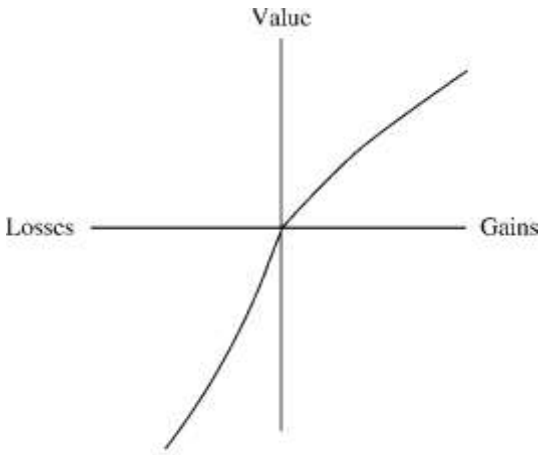
Appendix



Source: Kahneman and Tversky (1979, p. 279)

Illustration #1: The Value Function (Kahneman and Tversky 1979, p. 279)

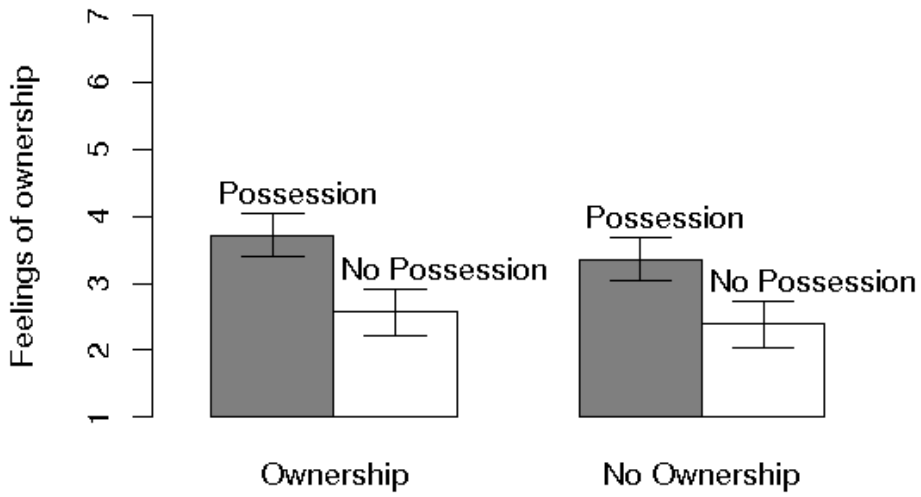


Illustration #2: The effect of factual ownership and possession on feelings of ownership (Reb and Connoly 2007, p. 112)

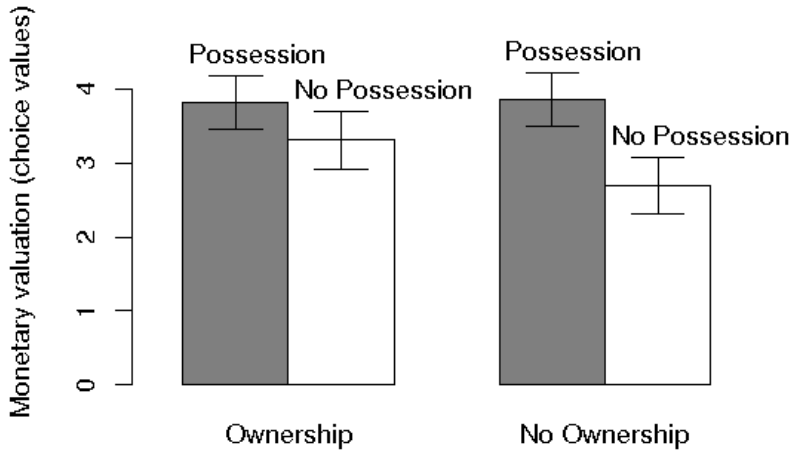


Illustration #3: The effect of possession on monetary valuation (Reb and Connoly 2007, p. 108)

Questionnaire 1 (in Czech)

Identifikační číslo:		Jméno:	
		Příjmení:	

Dotazník #1

1. Jste:
   A) žena
   B) muž

2. Jaký je Váš věk?

3. Z jak velkého města pocházíte?
   A) méně než 2 000 obyvatel
   B) od 2001 do 10 000 obyvatel
   C) od 10 001 do 50 000 obyvatel
   D) od 50 001 do 100 000 obyvatel
   E) od 100 001 do 500 000 obyvatel
   F) více než 500 000 obyvatel

4. V jaké kategorii se nalézá Vaše rodina z hlediska čistého měsíčního příjmu domácnosti?
   A) méně 10 000Kč
   B) od 10 001 Kč do 20 000Kč
   C) od 20 001Kč do 40 000Kč
   D) od 40 001 Kč do 80 000Kč
   E) od 80 001 Kč do 130 000Kč
   F) více než 130 000Kč

5. Jaký je Váš osobní měsíční příjem (kapesné, mzda, stipendia a další)?
   A) do 2 500Kč
   B) od 2 501Kč do 5 000Kč
   C) od 5 001Kč do 7 500Kč
   D) od 7 501Kč do 10 000Kč
   E) více než 10 001 Kč

6. Na škále **od 1 – Velmi nešťastný/á** do **7 – Velmi šťastná/á,** označte, jak spokojení jste se svou momentální životní situací.

   Jak byste ohodnotili Vaši momentální životní spokojenost?

1	2	3	4	5	6	7

7. Na škále od **1 – silně nesouhlasím** do **7 – plně souhlasím**, označte, na kolik, je pro Vás dané tvrzení pravdivé.

   Rád zkouším nové věci a zážitky.

1	2	3	4	5	6	7

8. Na škále od **1 – silně nesouhlasím** do **7 – plně souhlasím,** označte, na kolik, je pro Vás dané tvrzení pravdivé.

   Narazím-li na problém, snažím se získat, co největší množství informací vedoucích k jeho řešení.

1	2	3	4	5	6	7

9. Na škále od **1 – silně nesouhlasím** do **7 – plně souhlasím**, označte, na kolik, je pro Vás dané tvrzení pravdivé.

   Jakmile se soustředím na nějakou činnost, ztrácím pojem o čase a okolí.

1	2	3	4	5	6	7

10. Na škále od **1 – silně nesouhlasím** do **7 – plně souhlasím**, označte, na kolik, je pro Vás dané tvrzení pravdivé.

    Obdivuji osoby, které vlastní luxusní domy, věci, auta a oblečení.

1	2	3	4	5	6	7

11. Na škále od **1 – silně nesouhlasím** až **7 – plně souhlasím**, označte, na kolik, je pro Vás dané tvrzení pravdivé.

    Rád/a nakupuji nové věci.

1	2	3	4	5	6	7

12. Na škále od **1 – silně nesouhlasím** do **7 – plně souhlasím**, označte, na kolik, je pro Vás dané tvrzení pravdivé.

    Cítil/a bych se mnohem šťastnější, kdybych vlastnil/a určité věci, které nevlastním.

1	2	3	4	5	6	7

13. Posíláte přání poštou (nikoli SMS, nebo elektronická pošta)?
    A) ano
    B) ne

14. Napsal/a jste někdy milostný dopis?
    A) ano
    B) ne

15. Kolik přibližně přečtete ročně knih v elektronickém formátu (MOBI, pdf, …)?

16. Kolik přibližně přečtete ročně knih v tištěném formátu?

15. Místo toho, abyste četl/a dlouhý text z monitoru, vytisknete si ho (máte-li možnost)?
    A) vždy
    B) téměř vždy
    C) občas
    D) téměř nikdy
    E) nikdy

Questionnaire 2 – Part 1 (in Czech)

Identifikační číslo:		Jméno:	
		Příjmení:	

Dotazník #2
První část

Pro každou z uvedených otázek vyplňte – prosím - odpověď jako částku v Kč.

A) Jakou částku byste byli ochotni zaplatit v podobě zvýšení ceny za to, že na obalu bagety bude uveden údaj o energetické hodnotě výrobku?
_____ Kč

B) Jaká částka by podle Vás měla být stržena z ceny, za to, že na jejím obalu přestal být uveden údaj o energetické hodnotě výrobku?
_____ Kč

A) Jakou částku byste byli ochotni zaplatit v podobě zvýšení ceny za to, aby na krabičce léku proti kašli bylo uvedeno, kolik obsahuje procent alkoholu?
_____ Kč

B) Jaká částka by podle Vás měla být stržena z ceny léku proti kašli za to, že na něm přestal být uveden údaj o obsahu alkoholu?
_____ Kč

A) Jakou částku byste byli ochotni zaplatit v podobě zvýšení ceny za to, aby na balení stolní vody byl uveden údaj o obsahu minerálů?
_____ Kč

B) Jaká částka by podle Vás měla být stržena z ceny balení stolní vody za to, že na ní přestal být uveden údaj o obsahu minerálů?
_____ Kč

A) Jakou částku byste byli ochotni zaplatit v podobě zvýšení ceny za to, aby na balení kávy byl uveden údaj o zemi původu?
_____ Kč

B) Jaká částka by podle Vás měla být stržena z ceny kávy, za to že na jejím balení přestal být uveden údaj o zemi původu?
_____ Kč

A) Jakou částku byste byli ochotni zaplatit v podobě zvýšení ceny za to, aby na balení syrového masa byl uveden údaj o místě jeho původu?

_____ Kč

B) O jakou částku byste požadovali, aby se snížila cena balení syrového masa za to, že na něm přestal být uveden údaj o místě jeho původu?

_____ Kč

Questionnaire 2 – Part 2A (in Czech)

Druhá část

Pro každou z uvedených otázek označte - prosím - na kolik pokládáte uvedený údaj za důvěryhodný na škále od 0% - vůbec informaci nevěřím do 100% - pokládám informaci za důvěryhodnou.

1) Při útoky na budovy Světového obchodního centra sehráli určitou úlohu zpravodajské služby USA. [Zdroj: Hecker, Robert. (2002) America in War, ISBN 80-204-0105-9]

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

2) Díky používání bezhotovostního platebního styku mohou vlády lépe monitorovat život občanů. [Zdroj: Schubert, James. (2005): Credit Card Bias, ISBN 50-605-0785-6]

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

3) Jedním z důvodů, proč se přidává fluorid do zubní pasty je, aby lidé byli poslušnější. [Zdroj: Kubaczek, Peter. (2006): Fluorid and Docility, ISBN 80-401-0569-2]

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Questionnaire 2 – Part 2B (in Czech)

Druhá část

Pro každou z uvedených otázek označte, prosím, na kolik pokládáte uvedený údaj za důvěryhodný na škále od 0% - vůbec informaci nevěřím do 100% - pokládám informaci za důvěryhodnou.

1) Při útoky na budovy Světového obchodního centra sehráli určitou úlohu zpravodajské služby USA. [Zdroj: Hecker, Robert. (2002) America in War, (dostupné online: www.americainwar.us)]

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

2) Díky používání bezhotovostního platebního styku mohou vlády lépe monitorovat život občanů. [Zdroj: Schubert, James. (2005): Credit Card Bias, (dostupné online: www.jamesschubert.com]

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

3) Jedním z důvodů, proč se přidává fluorid do zubní pasty je, aby lidé byli poslušnější. [Zdroj: Kubaczek, Peter. (2006): Fluorid and Docility, (dostupné online: www.fluoridtheory.com]

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Induced value voucher