ONLINE SOCIAL COMPARISON: IMPLICATIONS DERIVED FROM WEB 2.0

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Abstract

Online purchase has become a mainstream channel for modern consumers to acquire goods and services. With the emergence of Web 2.0, consumers are now able to view and exchange product information with trusted friends instead of strangers. The result is that the effects of social comparison can be naturally created while consumers communicate with their friends online. However, while the effects of social comparison on consumer purchases have been validated in the physical world, not much research has been dedicated to studying these effects in the virtual world. Therefore, in our research, we aim to empirically investigate how different kinds of social comparisons (physical social and virtual social) impact consumers’ online purchasing behavior. In particular, we propose to use the concept of reference-point shift extended from Prospect Theory as the theoretical basis to account for consumers’ decision making in an online purchasing environment. The empirical results of our two experiments consistently support most of our hypotheses. The results explicitly indicate that social comparison positively impacts consumers’ psychological states (happiness and disappointment) and their willingness to buy and willingness to pay. Most interestingly, the value functions we depict based on the empirical results graphically demonstrate how social comparison induces the effect of reference-point shift.

Keyword: social comparison, online purchasing behavior, prospect theory, reference-point shift.
INTRODUCTION

The recent emergence of Web 2.0 has opened a new page in the history of the Internet and has quickly changed the way businesses and people use the Internet (O’Reilly 2005). Internet users have transitioned from passively working with information to actively creating content. The concept of Web 2.0 is very simple; it is a social phenomenon where consumers are in control and have the capability to create content and build personal relationships (Parise & Guinan 2008). Facebook, one of the most popular Web 2.0 sites, has more than 24 million members and is adding 150,000 more daily (Kirkpatrick 2007). One of the key reasons why Facebook and other Web 2.0 companies were able to create such strong networks in such a short time is because the concept of Web 2.0 satisfies human curiosity about others. It allows users to know more about other users, including their likes and dislikes. Mark Zuckerberg, the CEO of Facebook, said: “People influence people. Nothing influences people more than a recommendation from a trusted friend….” (Davis 2008). This kind of interpersonal influence exemplifies the effects of social comparison. The emergence of Web 2.0 extends the definition of friends in the online environment because it successfully links consumers’ friends from the physical and virtual worlds together (Facebook 2007). With the advanced information technology tools provided on the Web 2.0, consumers could exchange product information with their physical and virtual friends even more effectively and efficiently. This leads us to wonder whether the effects of social comparison, generated from physical and virtual worlds, would impact consumers’ online purchasing behavior. The number of Web 2.0 users is still growing rapidly; each and every one represents a potential online shopper. Hence, it is urgent and important to understand how social comparisons influence consumers’ online purchasing decisions. Specifically, we aim to empirically investigate how different kinds of social comparisons (physical social and virtual social) affect consumers’ psychological states and alter their online purchasing decisions.

LITERATURE REVIEW

2.1 Consumer Decision Making

Decision making has received a great deal of attention from both industry and academia. Past literature has shown that humans typically are not rational and do not make consistent choices (Tversky & Kahneman 1981). Kahneman and Tversky (1979) proposed Prospect Theory to account for such aspects of decision making, and it is empirically supported in numerous subjects and fields (Fox & Tversky 1998, Hoch & Loewenstein 1991). According to Prospect Theory, decision making under risk can be viewed as making choices between prospects. These prospects are the combinations of gains or losses and their probability of occurrence. During the decision making process, humans first analyze and evaluate the prospects and then choose the prospect with the highest expected utility. When considering the same magnitude of gains and losses, the pain of losing one object is much stronger than the joy of gaining the same object. Moreover, essential to Prospect theory is the concept of reference point, deviations from which define “gain” and “loss”. The key idea behind the reference point is that people do not simply judge outcomes based on an absolute scale but with a reference point in their mind. Based on the foundation of Prospect Theory, Hoch & Loewenstein (1991) added the concept of reference-point shift to explain the rationale behind making purchasing decisions. The reference point is a psychological point which one adapts when making subjective comparisons (Hoch & Loewenstein 1991). For example, imagine that you purchased a stock at the price of $80, and soon the stock price grew to $100. Assuming your reference point resided at the price of $80, you would consider that the value of your stock had increased $20. However, if the stock price now dropped $10, you would consider that the value of your stock had decreased $10 instead of increased $10. This means that your reference point had shifted from $80 to $100. Therefore, when the stock price dropped $10, you no longer considered a gain of $10 from $80 but a loss of $10 from $100. The
perceptions differ due to different reference points one adapted when making the comparison. Using different reference points to judge the same object due to influences of certain factors is the effect of reference-point shift (Hoch & Loewenstein 1991). The effect of reference-point shift could be caused by various reasons. Hoch and Loewenstein (1991) proposed that social comparison is an essential factor that could alter consumers’ psychological states and causes the reference-point shift in the traditional purchasing environment. In light of the ongoing paradigm shift from traditional purchasing channels to Internet-based purchases, we attempt to employ the concept of reference-point shift to the context of online purchases and empirically validate whether its explanatory power for this relatively new purchasing channel remains strong.

Figure 1 illustrates the effect of a reference-point shift in a value function diagram with respect to consumers’ satisfaction level when the purchase is made or not made. Important to note is that the focus of this diagram is the effect of reference-point shift; therefore the value function is depicted with straight lines rather than curves. The no-adaptation value function originally proposed by Prospect Theory (dotted line in Figure 1) describes a situation where a consumer who would derive satisfaction from owning an object but who has not adapted the feeling of actually possessing it. The reference point residing on the origin (point A) means that the consumer takes a neutral position when initially faced with the purchase choice. The neutral position here means that he has no special desire for the object. If he makes the purchase, he perceives positive satisfaction (referring to distance D1); if he fails to purchase the object, he perceives zero satisfaction, no positive satisfaction, and no negative satisfaction either. On the other hand, when the reference point is shifted from point A to B, the effects of reference-point shift become clear (Hoch & Loewenstein 1991). The partial-adaptation value function depicted by the solid line illustrates a situation where the consumer would derive positive or negative satisfaction from owning or not owning an object and has partially adapted the feeling of actually possessing it. In this case, the consumer’s initial reference point no longer resides in a neutral position but shifts to the right. If the purchase is made, the total satisfaction he perceives is distance D2, which contains both positive and negative satisfaction. If the purchase is not made, he perceives negative satisfaction, which is the deprivation (referring to distance D3). Based on principles of Prospect Theory, the slope associated with the negative satisfaction is bigger than the slope associated with positive satisfaction. After the reference point shifts, this principle still stays true. Thus, D3 is greater than D1. Since D2 is greater than D3, this leads to the conclusion that D2 would be greater than D1. In this way, the partial-adaptation value function mathematically explains why consumers’ purchase desire is stronger after the reference point shifts as compared to before. In our research, we attempt to empirically test whether the effect of reference-point shift can account for online purchasing decisions when social comparison exists.

Similar to the construct of satisfaction in Hoch & Loewenstein’s research, we use happiness to measure positive utility and disappointment to measure negative utility. Moreover, similar to the construct of purchase in Hoch & Loewenstein’s research, we use willingness to buy as our measurement. The utility (y-axis) refers to the positive and negative utilities consumers perceive when the purchase is made or not made; and the willingness to buy literally refers to consumers’ purchase willingness.
2.2 Social Comparison

Comparing oneself with others, intentionally or unintentionally, is a pervasive social phenomenon and is an important part of human experience (Festinger 1954, Suls & Wheeler 2002). When comparing themselves with others, people tend to select a person or group to serve as a point of comparison or as a reference group (Khan & Khan 2005, Schiffman & Kanuk 2000). The reference group could be someone familiar or who is similar to oneself in ability, such as a relative, friend, or co-worker. Or the reference group could be someone who is not directly related or who is a superior, such as celebrities (Schiffman & Kanuk 2000). According to Festinger (1954), the effect of social comparison could also be used to explain why consumers attempt to use other people/reference groups as a source of information when making the purchasing decisions. When making the purchasing decision, people might be consciously or subconsciously comparing their choices with others and are sensitive to the social comparison cues relevant to their choices (Bearden & Rose 1990). This means that the effect of social comparison exists due to the fact that people are concerned or care about reactions of others/reference groups (Bearden & Rose 1990). Prior research especially indicates that this effect plays an essential role in influencing the consumer purchasing decision and causes the result in impulsive purchases (Luo 2005, Rook 1987, Zhang et al. 2006). Impulsive purchase is defined as unplanned purchase and usually arises immediately upon confrontation with a certain stimulus (Wolman 1973). It is a spontaneous force that suddenly drives consumers to make a great deal of purchases (Rook 1987). If social comparison would increase the desire of consumers to possess the products that other people already have, there are two interesting questions to ask: (1) does this effect occur in the online environment (2) if this effect could occur in the online environment, where could be the source of reference?

In the online shopping environment, effects of social comparison could be generated from two main sources: physical and virtual worlds. The effect generated from the physical world refers to the information one receives from reference groups, such as friends or favorite celebrities, in the physical world. On the other hand, the effect generated from the virtual world could refer to the information one receives from online reference communities, such as friends from online chat rooms or Web 2.0. Nevertheless, social effects could be generated by different sources and various methods. This research would specifically focus on the two main sources (physical world and virtual world) and investigate how these effects impact consumers’ online purchasing behavior. Much research indicates that other people’s opinions and compliments could influence consumers’ purchasing behavior (Luo 2005). When a person is placed in a product evaluation situation where he or she is unable to adequately assess the characteristics of the product from direct observation and contact, he will view the reactions of others as the nature of the product or get affected by other people’s opinions in regard
to the product (Burnkrant & Cousineau 1975). This description matches with some cases of online purchase because consumers have less chance to physically inspect or touch some of the online products. According to Hoch & Loewenstein (1991), social comparison could possibly shift consumers’ reference point and increase consumers’ willingness to buy a product. Therefore, it is logical to infer that if many of one’s friends in the physical world have purchased an object and all of them have positive comments about it, one’s desire to purchase the same object online may be positively influenced (Loewenstein 1991). Or when performing online shopping, if one notices that the product has been furiously discussed or strongly recommended by online friends; consumers’ intention to purchase the product may be affected positively. Based on the above inferences, we have our first two hypotheses generated. We specifically focus on two social sources in this stage of research: 1) social comparison generated by friends and relatives in the physical world, and 2) social comparison generated by online friends in the virtual world.

**H1A:** Willingness to buy a product is higher in the physical social comparison group than in the non-social comparison group.

**H1B:** Willingness to buy a product is higher in the virtual social comparison group than in the non-social comparison group.

Social comparison exerts a force that can either create positive or negative consumer utility, which consequently influences the purchase of, or failure to purchase, a product (Burnkrant & Cousineau, 1975). The positive or negative utility refers to the happiness or disappointment consumers perceive if the purchase is made or not made. For example, a causal Web viewer browses through the electronic products listed on the online shopping store. He probably would not pay much attention to a typical MP3 player with only basic product specifications, unless he has specific needs. According to Prospect Theory, this is the no-adaptation state, referring to the solid line in Figure 1. In this case, if he fails to purchase the MP3 player, he perceives zero utility (no happiness and disappointment) because he has no special desire toward it; if he purchases it, he perceives pure positive happiness (D1). However, in the same context, if it is an MP3 that many of his friends and relatives desire or if it is the #1 seller on the Internet, he might be attracted. In this case, his willingness to buy has been positively affected by the social comparison. This means, his purchase intention no longer resides in a neutral position but enters the partial-adaptation state, indicated by the solid line in Figure 1. If he purchases the MP3 immediately, the utility he perceives contains both positive and negative utilities (D2). He may not be consciously aware of the negative utility at this point because he indulges in the joy (positive utility) of obtaining a new MP3 which others desire. Nevertheless, the happiness he perceives now is much greater because it contains two kinds of utility in contrast to the case where the reference point has not shifted (D2 > D1). Therefore, we hypothesize:

**H2A:** Perceived happiness of owning a product is higher in the physical social comparison group than in the non-social comparison group.

**H2B:** Perceived happiness of owning a product is higher in the virtual social comparison group than in the non-social comparison group.

The stronger intention (willingness to buy) one experiences to purchase the object, the more deprivation one feels when the object cannot be purchased (Hoch & Loewenstein, 1991). The deprivation here refers to the disappointment (negative utility) the consumer perceives if the product is not purchased. Continuing with the previous example, if the online shopper fails to purchase the MP3 that everyone wants, the deprivation he feels now would be much stronger because he perceives 0 utility in the case of not purchasing when the reference point has not shifted (D3 > 0). Therefore, we hypothesize:

**H3A:** Perceived disappointment of not owning a product is higher in the physical social comparison group than in the non-social comparison group.

**H3B:** Perceived disappointment of not owning a product is higher in the virtual social comparison group than in the non-social comparison group.
Once the purchase intention arises, consumers next decide whether to actually make the purchase by weighing the costs and benefits based on consumers’ subjective view (Hoch & Loewenstein, 1991). According to Thaler’s research in 1985, he argues that individuals perceive money to be an abstract good, and individuals may consistently differ in their judgments regarding the various uses of money. Also, according to Prospect Theory, people may perceive differently toward the same amount of monetary change due to the different reference points they adapt when making the comparison. All of the above statements suggest that people subjectively decide how much money to spend in exchange for an outcome they perceive as worthy. When consumers’ willingness to buy is positively affected by the social comparison, they would feel happier if the product is purchased and feel more disappointed if the product is not purchased in contrast to the case when social comparison does not exist. In this case, only a quick purchase, which is the impulsive purchase, could quell the feeling of deprivation and bring the feeling of happiness (Loewenstein 1988, Luo 2005). Since consumers’ willingness to buy is relatively high, they may they perceive the product value exceeds the product costs both in an economic and psychological sense. Therefore, it is logical to infer that consumers would be willing to pay more to acquire what they perceive is valuable. Therefore, we hypothesize:

\[ H4A: \text{Willingness to pay for a product is higher in the physical social comparison group than in the non-social comparison group.} \]

\[ H4B: \text{Willingness to pay for a product is higher in the virtual social comparison group than in the non-social comparison group.} \]

### 3 EXPERIMENT 1

#### 3.1 Experimental Design and Procedure of Experiment 1

The purpose of this experiment is to examine how social comparison generated from the physical and virtual world influences consumers’ psychological states and online purchasing behavior. The independent variable is social comparison, with three levels, which include non-social baseline, physical social (PS), and virtual social (VS). The dependent variables are willingness to buy, happiness, disappointment, and willingness to pay. The independent variable is a between-subject, fixed variable. Since we consider social comparison as a fixed variable and scenario as a random variable, therefore, F’ ratios, instead of F ratios, are calculated to test the effects of social comparison. Each respondent received 200NT dollars after completing the experiment. Experiment 1 was performed in a laboratory context at National Taiwan University. Questionnaires were distributed to 109 volunteer students. Subjects were randomly assigned to one of the three groups: baseline (36 subjects), PS (31 subjects), and VS (42 subjects). In the baseline condition, the scenario only described the purchasing purpose and product specification; On the other hand, the scenarios of the two social conditions described not only purchase purpose and product specification, but also other people’s (reference group in the physical or virtual world) purchase behavior.

#### 3.2 Test Materials and Subjects of Experiment 1

Table 1 illustrates the nine products we selected for the experiment. A scenario involving real-life online purchasing decisions were constructed for each product. Subjects were first asked to read the scenario passage and then answer the following four questions (Table 2). These four questions were the measurements of the dependent variables: willingness to buy, happiness (when the product is purchased), disappointment (when the product is not purchased), and willingness to pay. The variables of willingness to buy, happiness, disappointment, and willingness to pay were measured on a range of 1 to 100, with 0 as the lowest and 100 as the highest. Note that the scale we used to measure disappointment when the purchase is not made is on a positive range so that a larger number represents a larger degree of disappointment. As for willingness to pay, people were asked to fill in the price (in NT dollars) when they were willing to purchase the product.
Table 1. Nine selected products for the experiment.

<table>
<thead>
<tr>
<th>Index</th>
<th>Selected Items</th>
<th>Index</th>
<th>Selected Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (Practice)</td>
<td>MP3 Player</td>
<td>5</td>
<td>Airline Ticket</td>
</tr>
<tr>
<td>1</td>
<td>Computer Game</td>
<td>6</td>
<td>Hotel Reservation</td>
</tr>
<tr>
<td>2</td>
<td>Electronic Card</td>
<td>7</td>
<td>Travel Planning Package</td>
</tr>
<tr>
<td>3</td>
<td>Computer Software</td>
<td>8</td>
<td>Movie</td>
</tr>
<tr>
<td>4</td>
<td>Song</td>
<td>9</td>
<td>eLearning Video</td>
</tr>
</tbody>
</table>

Table 2. Four questions for each scenario.

<table>
<thead>
<tr>
<th>Index</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assuming you do not have this product described in the scenario, please self-evaluate your disappointment level if you do not own the product on a range of 1 to 100</td>
</tr>
<tr>
<td>2</td>
<td>In the same context, please self-evaluate your happiness level if you own the product on a range of 1 to 100.</td>
</tr>
<tr>
<td>3</td>
<td>Please self-evaluate your willingness level to purchase the product on a range of 1 to 100</td>
</tr>
<tr>
<td>4</td>
<td>Please offer a price that you are willing to pay for the product</td>
</tr>
</tbody>
</table>

3.3 Results of Experiment 1

The data was analyzed using the SAS 9.1.3. Given the large variation of the purchase willingness for the nine products, the variance with higher prices might override that of lower ones. To ensure that all products had equal chances in contributing to variances, we normalized the prices with the rescale technique provided in SAS, such that the prices of each product ranged from 1 to 100. The final results are shown in Table 3.

Table 3. Means and standard deviations (shown in parentheses) of willingness to buy, happiness, disappointment, and willingness to pay in the baseline, PS, and VS groups.

<table>
<thead>
<tr>
<th></th>
<th>Willingness to Buy</th>
<th>Happiness</th>
<th>Disappointment</th>
<th>Willingness to Pay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>43.99 (28.07)</td>
<td>65.05 (26.54)</td>
<td>40.92 (27.61)</td>
<td>10.99 (12.40)</td>
</tr>
<tr>
<td>Physical Social</td>
<td>48.82 (28.04)</td>
<td>68.42 (25.57)</td>
<td>48.95 (28.71)</td>
<td>11.17 (11.63)</td>
</tr>
<tr>
<td>Virtual Social</td>
<td>56.33 (26.15)</td>
<td>71.21 (19.14)</td>
<td>52.80 (24.63)</td>
<td>16.02 (17.87)</td>
</tr>
</tbody>
</table>

Multivariate analysis of variance (MANOVA) was first performed. The results show that the overall effect is significant (Wilks’ Lambda = 0.0063, $F(32, 49.53) = 4.56, p < .01$). Then, an analysis of variance between groups (ANOVA) was performed to examine the relationship between each dependent variable and social comparison. Lastly, Scheffe’s test was performed to compare the difference between different levels of social comparison. Subjects in the social groups have a higher level of willingness to buy than that in the baseline group (Baseline: 43.99, PS: 48.82, and VS: 56.33; $F(2, 106) = 5.69, MSe = 2413.89, p < .01$). The results of the Scheffe’s test show that the difference for willingness to buy is statistically significant for VS and baseline ($t = 3.29, p < .01$) and VS and PS ($t = 1.92, p < .05$) but not for PS and baseline ($t = 1.19, n.s.$). Moreover, subjects in the social groups feel happier than their counterparts in the baseline group when they can acquire the product (Baseline: 65.05, PS: 68.42, and VS: 71.21; $F(2, 106) = 2.52, MSe = 1316.23, p < .08$). Although the difference is not significant at the level of .05, it is significant at the level of .1. The results of the Scheffe’s test show that the difference for happiness is statistically significant for VS and baseline ($t = 2.20, p < .05$) but not for PS and baseline ($t = 1.12, n.s.$) and VS and PS ($t = .96, n.s.$). Subjects in the social comparison groups feel a significantly larger degree of disappointment (Baseline: 40.92, PS: 48.95, and VS: 52.80) when they cannot own the target product ($F(2, 106) = 4.95, MSe = 2537.97, p < .01$). The results of the Scheffe’s test show that the difference for disappointment is statistically significant.
for VS and baseline (t = 3.12, p < .01) and PS and baseline (t = 1.95, p < .05) but not for VS and PS (t = .97, n.s.). Lastly, subjects in the social groups are willing to pay a higher price to purchase the product than that in the baseline group (Baseline: 10.99, PS: 11.17, and VS: 16.02; F(2, 106) = 7.44, MSe = 372.70, p < .01). The results of the Scheffe’s test show that the difference for willingness to pay is statistically significant for VS and baseline (t = 3.44, p < .01) and VS and PS (t = 3.18, p < .01) but not for PS and baseline (t = .12, n.s.). In conclusion, hypothesis 1A, 1B, 3A, 3B, 4A, and 4B are significantly supported and hypothesis 2A and 2B are marginally supported. Overall, experimental results consistently showed that social comparison does create a significant impact on the respondents’ psychological states and does increase their impulsiveness to buy the target product. This means that it is legitimate to use the concept of reference-point shift to account for the social effect in an online purchasing environment.

Besides, we depicted the value function based on our experimental data. The two values we used to depict the functions are willingness to buy and utility. We first calculated the average of willingness to buy and utility (happiness and disappointment) for each scenario and used the results to depict three value functions in their best fit trends. Three value functions shown in Figure 2 are: baseline group (in ———), PS group (in ———), and VS group (in ———). The willingness to buy depicted in x-axis simply refers to respondents’ purchase willingness toward the product. The utility in y-axis refers to two kinds of utilities: disappointment and happiness. The disappointment refers to the negative utility respondents perceive when the purchase is not made; the happiness refers to the positive utility respondents perceive when the purchase is made. The value function we depicted for the happiness and purchase willingness lies on the upper right in Figure 2. As regards to the disappointment, although we measure it in positive terms, it makes sense to illustrate it in negative terms in the value function diagram because it is a negative utility. Given that there is a positive correlation between the disappointment and purchase willingness, we convert both values to negative. Therefore, the value function for the disappointment and purchase willingness lies on the lower left in Figure 2. This value function diagram graphically demonstrates how the effects of social comparison shift the social value function to the right in comparison to the baseline. This means, with the interference of social comparison, respondents’ reference point shift right-ward and purchase intention becomes much stronger. Consequently, they become happier when purchasing the products and more disappointed when not purchasing the products. This suggests that the concept of reference-point shift can legitimately explain the effects of social comparison on purchase decisions in an online purchasing environment. According to Prospect Theory, the slope associated with the positive utility is smaller than the one associated with the negative. This phenomenon could be seen in the baseline and PS group (Baseline: 0.76 < 1.09; PS: 0.87 < 1.17) but not in the VS group (1.13 > 1.05).
4 EXPERIMENT 2

4.1 Experimental Design and Procedure of Experiment 2

To ensure that our experiment was not limited to student sample pool, we conducted a second experiment in an online environment and invited web users, who study or work in different fields, to participate in the experiment. In total, 126 subjects responded to our online advertisement and voluntarily participated in this experiment. Similar to Experiment 1, subjects were randomly assigned to one of the three groups: baseline (36 subjects), PS (40 subjects), VS (50 subjects). The setting and test materials were exactly the same as the ones in Experiment 1.

4.2 Results of Experiment 2

Table 4 demonstrates the empirical results of Experiment 2. The MANOVA Wilks’ Lambda analysis suggests that the difference between the baseline and the two social groups is significant (Wilks’ Lambda = 0.0015, $F(7,39, 32) = 7.39, p < .01$). Subjects in both social groups are significantly more willing to buy the target products (50.78 for PS and 52.61 for VS) than the baseline (41.43; $F'(2, 99) = 5.81, MSe = 2154.67, p < .01$). The results of the Scheffe’s test show that the difference for willingness to pay is statistically significant for VS and baseline ($t = 3.28, p < .01$) and PS and baseline ($t = 2.61, p < .01$) but not for VS and PS ($t = .56, n.s.$). Similarly, subjects in both social groups feel happier (66.46 for PS and 65.44 for VS) than the subjects in the baseline when they can acquire the products (60.96). However, the difference is not statistically significant ($F'(2, 99) = 1.34, MSe = 2180.87, n.s.$). The results of the Scheffe’s test show that the difference for happiness is statistically significant for VS and baseline ($t = 1.32, p < .1$) and PS and baseline ($t = 1.54, p < .1$) but not for VS and PS ($t = .31, n.s.$). Nevertheless, both social groups reported a higher level of disappointment (46.02 for PS and 46.39 for VS than the baseline (36.04; $F'(2, 99) = 4.38, MSe = 2834.98, p < .01$) when they did not own the target products. The results of the Scheffe’s test show that the difference for disappointment is statistically significant for VS and baseline ($t = 2.72, p < .01$) and PS and baseline ($t = 2.49, p < .01$) but not for VS and PS ($t = .1, n.s.$). Subjects in the social groups also are willing to pay a higher price (13.48 for PS and 15.95 for VS) than the baseline (11.57; $F'(2, 99) = 3.7, MSe = 494.69, p < .05$). The results of the Scheffe’s test show that the difference for willingness to pay is statistically significant for VS and baseline ($t = 2.46, p < .01$) and PS and baseline ($t = 1.79, p < .1$) but not for VS and PS ($t = .42, n.s.$).

<table>
<thead>
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<th>Disappointment</th>
<th>Willingness to Pay</th>
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</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>41.43 (29.96)</td>
<td>60.96 (30.21)</td>
<td>36.04 (32.38)</td>
<td>11.57 (14.15)</td>
</tr>
<tr>
<td>Physical Social</td>
<td>50.78 (27.82)</td>
<td>66.46 (28.48)</td>
<td>46.02 (28.85)</td>
<td>13.48 (16.96)</td>
</tr>
<tr>
<td>Virtual Social</td>
<td>52.61 (25.73)</td>
<td>65.44 (23.71)</td>
<td>46.39 (25.28)</td>
<td>15.95 (18.78)</td>
</tr>
</tbody>
</table>

Table 4. Means and standard deviations of disappointment, happiness, willingness to buy and willingness to pay in the baseline, PS, and VS groups.

In conclusion, hypothesis 1A, 1B, 3A, 3B, 4A, and 4B are empirically supported by the results while hypothesis 2A and 2B are not. Although the difference for happiness is not significant, the means of happiness for two social groups are still greater than that for the baseline group. Overall, subjects in the social groups successfully reveal a higher level of disappointment, happiness, willingness to buy and willingness to pay than the subjects in the non-social group. The empirical results of experiment 2 replicated the patterns found in experiment 1. That is, the results found in this research are robust and applicable to heterogeneous groups.
The value functions we depicted for this experiment are shown in Figure 3. Similar to Experiment 1, the effect of social comparison shifts the social value functions to the right in comparison to the baseline. In this experiment, all three value functions match with the prediction in Prospect Theory; the slope associated with the positive utility is much smaller than the one associated with the negative utility (Baseline: 0.88 < 1.14; PS: 0.81 < 1.02; VS: 0.77 < 1.31).

Figure 3. Value function of the PS, VS and the baseline groups in Experiment 2.

5 CONCLUSIONS AND DISCUSSIONS

In conclusion, this research empirically demonstrates how we can use the concept of reference point shift to account for the effects of social comparison in an online purchasing environment. Furthermore, our research investigated two different sources of social influence, PS and VS, and observed their impacts on online purchasing behavior. The value functions we depicted based on two experiments with different sample pools (students vs. online users) illustrate consistent patterns. In both diagrams, the social value functions shift in parallel to the right in comparison to the baseline. This suggests that consumers perceive stronger purchase intention if the target product is purchased when the social comparison is present. The diagrams also show that the slope associated with the negative utility is much bigger than the one associated with the positive utility. This implies that the deprivation (i.e. disappointment or deprivation) consumers perceive when the purchase is not made is much stronger than the happiness consumers perceive when the purchase is made. Given the fact that humans are social in nature, such negative emotions could be easily induced by the effects of social comparison.

Our empirical results in both experiments show that people in social groups generally perceive stronger willingness to buy, happiness, disappointment, and willingness to pay than the non-social group. The results clearly demonstrate that the effects of social comparison could create a significant influence on consumers’ online purchasing behavior. Although the difference for happiness is not statistically significant in Experiment 2, the means of happiness for the two social groups are bigger than that for the baseline in both experiments. One possible explanation is that the effect of the primitive form we used in the social groups (i.e. simply saying that many of one’s friends and relatives own an object or have positive comments to say about the object) is not strong enough to induce all effects of social comparison. Further research is needed in this area.
6  MANAGERIAL IMPLICATIONS, LIMITATIONS AND FUTURE RESEARCH

6.1 Managerial implications

The empirical results suggest that there are two ways to induce consumers’ online purchasing desire: PS and VS comparison. Both effects could be retained in an online environment and significantly increase consumers’ willingness to buy, happiness, disappointment, and willingness to pay. We believe our empirical research provides many interesting and meaningful implications. E-marketers should leverage the lessons we learned from these two experiments and, most importantly, find a way to combine these two social effects. In fact, Web 2.0 is a kind of online platform that could easily combine these two effects. One of the main specialties of Web 2.0 is that it allows users to connect to friends or friends’ friends from both physical and virtual world. They are free to share thoughts, exchange opinions, and form their own online community. As mentioned earlier, Facebook is one of the Web 2.0 companies which has been particularly successful in this area. Furthermore, a new system called Beacon has recently been launched with the intention of leveraging the effects of social comparison generated from both physical and virtual worlds to impact consumers’ purchasing behaviours (Hirsh 2007). Beacon partners with 44 sites and shares user data and purchasing activities among them. Every time Facebook users engage in a purchasing activity at a partner site, all of their Facebook connections would be informed of their purchasing actions. This reporting ability allows Facebook and their partners to build accurate user profiles and deliver relevant advertisements to the target audiences. Moreover, every report delivered in the network represents a trusted referral from friends, which could be more powerful than any advertisement. This system could potentially generate immense revenue for Facebook due to their realization of social comparison effects. Nonetheless, Facebook has received strong complaints and opposition from users concerned for the privacy issue. While it is true that friends’ online activities could possibly influence purchasing decisions, this also means that they need to give up their privacy and expose their purchasing activities to their friends and even other unknown companies. The lesson learned from this ongoing situation implies that it is important to properly leverage the effects of social comparison. Improper use of the effects might cause more harm than benefit. Another possible way for e-marketers to create social effects in an online environment while avoiding privacy issues is to include a feedback mechanism with the promoted products. Users can voluntarily post messages via the feedback mechanism to exchange product information and purchase experience; thus allowing effects of social comparison to naturally occur during the conversations. No privacy issues would be violated because users consciously opted to share the information with others.

6.2 Limitations

Some limitations of this study should be noted. First, the method of collecting data in Experiment 2 could be a limitation even though it solves the problem of external validity. People answering questionnaires online could be distracted by their environment and hence not be as focused or involved as people fulfilling their tasks in the controlled lab environment. Therefore, internal validity might suffer. However, the consistent responses from our two experiments convince us that our results do uncover some aspects of online purchasing behavior. Second, we treat all products as homogeneous items in this research while different product categories might result in different kinds of purchasing behaviors. Further research is needed in this area.

6.3 Future Research

A series of research projects focused on the topic of online purchasing behaviour has been planned. First, we are interested in investigating how social effects could possibly interact with different kinds of product information (consummatory and nonconsummatory) and product categories (search and experience goods). Research on these factors can answer the following interesting questions: Which
kinds of product information are people more willing to share online? Which product categories would induce more social effects? Second, it will be interesting to explore whether factors other than social comparison could also induce the effect of reference-point shift. Besides social comparison, temporal proximity and physical proximity are another two factors that could increase consumers’ drive to consume goods (Hoch & Loewenstein 1991). One possible research direction is to assess whether temporal proximity and physical proximity could induce a reference-point shift and impact consumers’ online purchasing behavior. At last, the purpose of this research is to investigate how effects of social comparison affect consumers’ psychological states and impact their online purchasing decisions. Although we pointed out that effects could be generated from the physical and virtual worlds, we did not thoroughly compare the differences (e.g. psychological impacts and effect strength) between these two sources. Future research is needed in this area.

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