

2010

PRESTIGE GOODS AND SOCIAL STATUS IN VIRTUAL WORLDS

Oliver Hinz

Goethe-University of Frankfurt, ohinz@wiwi.uni-frankfurt.de

Martin Spann

Ludwig-Maximilians-University Munich, spann@spann.de

Il-Horn Hann

University of Maryland, ihann@rhsmith.umd.edu

Follow this and additional works at: http://aisel.aisnet.org/icis2010_submissions

Recommended Citation

Hinz, Oliver; Spann, Martin; and Hann, Il-Horn, "PRESTIGE GOODS AND SOCIAL STATUS IN VIRTUAL WORLDS" (2010).
ICIS 2010 Proceedings. 190.

http://aisel.aisnet.org/icis2010_submissions/190

This material is brought to you by the International Conference on Information Systems (ICIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ICIS 2010 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

PRESTIGE GOODS AND SOCIAL STATUS IN VIRTUAL WORLDS

Completed Research Paper

Oliver Hinz

School of Business and Economics
Goethe-University of Frankfurt
ohinz@wiwi.uni-frankfurt.de

Martin Spann

Munich School of Management
Ludwig-Maximilians-University Munich
spann@spann.de

Il-Horn Hann

Robert H. Smith School of Business
University of Maryland
ihann@rhsmith.umd.edu

Abstract

We study the effect of conspicuous consumption on social status in an online virtual world. Based on previous literature, we hypothesize that purchases of rare items can confer higher social status. We test this effect at the German Habbo Hotel, an online social network with more than 1.5 million registered users. Using propensity scoring algorithm, we separate the selection effect (e.g., more active/attractive players buy prestige goods) from the treatment effect (e.g., buying prestige goods increases social status). Our results indicate a significant and large effect of conspicuous consumption on status improvement. A subject who is conspicuously consuming wins on average 13.2 friends while his matching twin wins only 5.1 friends over the same time period. This seems consistent with the notion that conspicuous consumption can be seen as an investment in social status.

Keywords: Virtual Worlds, Social Status, Social Capital, Conspicuous Consumption, Prestige Goods

Mia: Why would I care about your car?

Charlie: It's an \$80,000 Mercedes.

Mia: Yeah, so what does it do that other cars don't do?

Charlie: It costs \$80,000!

(Two and a half man, Season 3)

Introduction

In his seminal book “The Theory of the Leisure Class”, Veblen (1899) formulated the idea of conspicuous consumption. This term refers to the practice of purchasing products to signal social status others (Mason 1981; Braun and Wicklund 1989). Veblen argued that people often consume highly conspicuous goods and services in order to provide evidence for their wealth and to distinguish themselves from the lower class (‘invidious comparison’). The term “conspicuous consumption” thus describes the lavish spending on goods and services acquired mainly for the purpose of displaying income or wealth. The conspicuous consumer strives with displaying this consumption for attaining or maintaining social status.

The idea of conspicuous consumption is to attain or keep social status which is defined as a rank or position that one holds in a group or society (Linton 1936). Status attainment can be understood as a process by which subjects mobilize and invest resources for returns in socioeconomic standings (Lin 1999). In other words, people buy prestige goods to improve their social position. This phenomenon has often been reported (see, for example, Bagwell and Bernheim 1996) but literature on empirically measuring the impact of conspicuous consumption on social status quantitatively is scarce.

The lack of empirical evidence for this phenomenon is in part due to the difficulty to observe and measure social status. In most settings, it is even more difficult to measure changes in social status and the conspicuous consumption itself. However, due to the evolvement of the Web 2.0, more data on social interactions and social relationships has become available over the last years. This allows us to quantitatively examine the impact of purchase decisions on social status. As a key technique to analyze social structure, social network analysis has emerged and has been applied in a number of studies in management disciplines like IS, Marketing and Economics

(see, for example, Oestreicher-Singer and Sundararajan 2008). In nearly all cases measures derived from the social

networks are used as explanatory variables. If one aims to explain changes in social status, however, the network structure itself becomes the dependent variable.

In this paper we examine whether conspicuous consumption can improve social status in a virtual community. To empirically test this research question, we need to observe the changes of social status over time and thus the evolvement of network structure following an instance of conspicuous consumption. The virtual environment in our study is well suited for this purpose; it not only offers an opportunity to observe social status and purchases, but also instances of lavish spending that have no other purpose than to distinguish oneself from others.

The remainder of this paper is structured as follows: In the following section, we discuss previous literature on Veblen and positional goods, and show the economic impact of particular social positions in a network. We then build the bridge to concepts in social network analysis before introducing our empirical study, which builds upon data from a community with over 6 million members and nearly 100 million reported friendships. The paper concludes with a discussion of the results and directions for future research.

Previous Literature

Conspicuous and Status Consumption

Veblen goods are defined as a group of commodities for which peoples’ preference for buying them increases as a direct function of their price. A higher price confers greater status and contrary to the law of demand a higher price increases demand. This effect is called the Veblen effect and is named after the economist Thorstein Veblen, who

first pointed out the concepts of conspicuous consumption and status seeking. In his seminal book “The Theory of the Leisure Class” Veblen noted:

“The basis on which good repute in any highly organized industrial community ultimately rests is pecuniary strength; and the means of showing pecuniary strength, and so of gaining or retaining a good name, are leisure and a conspicuous consumption of goods.” (Veblen 1899, p. 70).

Therefore, the ‘Veblen effect’ is said to be existent whenever a consumer is willing to pay a higher price for a functionally equivalent good. Consistent to Veblen’s writings, Bagwell and Bernheim (1996) and Comeo and Jeanne (1997) argue that conspicuous consumption is a consequence of consumers’ desire to signal their wealth. Consumers may use their purchase decisions to signal a latent variable, such as status, which cannot be directly observed (Amaldoss and Jain 2005a). Besides ‘invidious comparison’ Veblen proposes an additional motive for consuming conspicuous goods which he terms ‘pecuniary emulation’. Pecuniary emulation refers to situations in which a member of a lower “class” consumes conspicuously in order to be perceived as a member of the higher “class.”

Such behavior can also be explained by social needs, i.e., personal traits that are not necessarily related to income levels or social status (Bearden et al. 1989; Tian et al. 2001). In this context, researchers differentiate two streams of social needs that have been identified as traits (Brewer 1991; McGuire 1968): the need for uniqueness and the need for conformity. People who want to satisfy their need for uniqueness, value products less when more consumers own it and vice versa. This represents their desire to be exclusive and “to dissociate themselves from the ‘common herd’” (Leibenstein 1950, p.189). The extent to which the demand is decreasing due to the fact that other people are also consuming this product is referred to as ‘snob effect’ (Amaldoss and Jain 2005a, Amaldoss and Jain 2005b; Grossman and Shapiro 1988; Leibenstein 1950). In contrast, some consumers value a product more as the number of additional consumers increases (Jones 1984; Ross et al. 1976). Leibenstein (1950) describes the extent to which the demand for a product increases as other people also consume it as ‘bandwagon effect’. As Leibenstein suggests, some people also desire to conform to the people they wish to be associated with or in order to be fashionable or in order to appear to be “one of the boys”.

The properties of market demand in the presence of such effects has generated a robust literature (e.g., Becker 1991, Frank 1985; Karni and Levin 1994, Navon et al. 1995). Becker (1991), for example, analyzes the bandwagon effect and shows why similar restaurants might eventually experience vastly different sales patterns. His model indicates that, in equilibrium the demand curve for followers could be upward sloping but the equilibrium is not stable. Similarly, Corneo and Jeanne (1997) investigated the presence of bandwagon and snob effect under conspicuous consumption in an analytical model. They show that the occurrence of such effects depends on how social norms allocate status on the basis of relative income. They further find that the demand curve for a conspicuous product is downward sloping for snobs and that it may be upward sloping if consumer behavior is conformist. Pesendorfer (1995) analyzes fashion cycles and finds that a design becomes obsolete as soon as a new fashion design arrives. Over time the price of a design declines as it is most desirable when it is new. Amaldoss and Jain (2005a) develop a formal utility-based model to examine the implications of social influences on consumer demand and firms' prices and profits. Using consumption externalities in their duopoly model they show that the desire for uniqueness leads to higher prices and firm profits. Moreover, they find that consumers purchase high-quality products not because of their desire for uniqueness but despite it, implying that marketers of conspicuous goods may find it beneficial not to emphasize the functional differences among their products when the need for uniqueness is high. In a second study Amaldoss and Jain (2005b) also demonstrate that in the context of a monopoly, snobs can have an upward-sloping demand curve, but only in the presence of both snobs and followers. Their findings further suggest that a monopolist should trigger the bandwagon effect to achieve higher profits.

Conspicuous consumption that exclusively focuses on the enhancement of status is also called status consumption. Eastman et al. (1999) define status consumption as “the motivational process by which individuals strive to improve their social standing through the conspicuous consumption of consumer products that confer and symbolize status both for the individual and surrounding significant others” (p. 42), while status itself can be described as “an expression of evaluative judgment that conveys high or low prestige, regard, or esteem” (Donnenwerth and Foal 1974, p. 786). Status is some type of power that is based on the respect, consideration and envy from other people (Eastman et al. 1999). Researchers make a distinction of three forms of status: status by definition or assignment (royalty), status by achievement (promotion at job), and status by consumption which is the focus in our study. Eastman et al. (1999) differentiate status consumption from conspicuous consumption in that status consumption involves purchasing a product or service that represents status to both the purchaser and the surrounding significant others, while conspicuous consumption only increases the purchaser’s own ego.

Research in this area has been concentrating on the development and validation of self-report scales to measure status consumption (Cass and Frost 2002; Eastman et al. 1999), the existence of status consumption (Chao and Schor 1998), analysis of brand associations like brand familiarity, brand symbolism or antecedents of status and conspicuous consumption (Braun and Wicklund 1989; Cass and Ewen 2004). Considering strategic implications of status, Hopkins and Korniekeno (2004) show that an increase in average income leads to more conspicuous consumption, but that a more affluent society will have lower utility at each income level. These findings imply that an increase in average income may be consistent with a decrease in social welfare.

To the best of our knowledge, no empirical research exists that investigates the extent to which the conspicuous consumption affects the status and thus, the social approval by others. This is not surprising given the difficulties to observe behavior and effect in real life, and highlights the need for research in this area.

Social Capital, Status, and Economic Impact of Social Position

Status is attained through the mobilization and investment of resources with the goal to increase one's socioeconomic standings (Lin 1982, 1995). Lin (1999) makes a critical contribution that is important to our work; he discusses the convergence of social resource theory and social capital theory. He argues that the social resource proposition (social resources exert effect on the outcome of an instrumental action such as attained status) can be restated as a social capital proposition (resources accessed in social networks exert effect on attained status). In his work, Lin (1999) subsequently provides an overview of the large body of research that supports the proposition that social capital enhances social status attainment.

Social capital theory emerged in the late 1970s and early 1980s (Coleman 1988). It refers to a variety of features in a social structure, e.g., community norms (Coleman 1990), group solidarity (Portes and Sensenbrenner 1993), trust and trustworthiness (Glaeser et al. 2000) but refers primarily to resources accessed in social networks (Portes 1998, Lin 1999). Further, the theory of social capital focuses on the instrumental utility of such resources and treats therefore social capital as an investment. The utility of social resources has been shown in various disciplines like Information Systems Research, Marketing, Sociology, and Economics.

In his seminal paper Mark Granovetter (1973) illustrated that weak ties enable reaching populations and audiences that are not accessible via strong ties and that owning such weak ties can help focal egos to attain new jobs (Granovetter 1974). Burt (1992) extended the weak ties argument by emphasizing that not the quality of any particular tie but rather the way these ties bridge different parts of networks is decisive. There are strategic advantages for subjects with ties into multiple sub-networks that are largely separated from one another. They constitute the only route through which information or other resources may flow from one sub-network to another. These advantages can be exploited and can be used to generate economic utility.

One example of economic relevance for this phenomenon has been delineated by Hinz and Spann (2008): The authors show that subjects who own an intermediary position in a social network of bidders in a Name-Your-Own-Price auction place significantly better bids because they are better informed due to information diffusion through the social network and valuable information is more likely to reach persons in these particular social positions.

It has also been pointed out in a number of studies that people in certain social positions are more likely to adopt new products earlier and are therefore more important for the diffusion process of innovations (e.g., Goldenberg et al. 2009, Gladwell 2000). Thus the social structure can have a substantial influence on the diffusion process (Bampo et al. 2008) and new strategies might improve the effectiveness of targeting by selecting subjects in certain social positions (Sundararajan 2006, Trusov et al. 2010). In economics, there is rich stream of literature on the impact of social networks on economic outcomes. Previous research has outlined the effect of networks on the outcome of job search (Montgomery 1991), probability of criminal activity (Calvó-Armengol et al. 2007), granting of credit (McMillan and Woodruff 1999) and welfare cultures (Bertrand et al. 2000). According to these insights, it is for subjects thus economically rational to improve their social status and their social position in a network. A better social position allows taking advantage of more valuable information and can help to find better jobs, place better bids in auctions or can make the subject more valuable for targeting purposes.

Conceptually it has been argued that conspicuous consumption can increase the social status through social capital (Lin 1999), but we are not aware of any study that shows empirically that this is in fact measurable and significant. We aim at closing this gap in literature and contribute to the ongoing discussion of conspicuous consumption.

Network Formation

Compared to literature that uses the social network as the explanatory variable, literature that uses the social network as the dependent variable is relatively scarce. According to Jackson (2006) two different research streams can be distinguished: One is based on the random graph theory and is influenced by research in computer science and statistical physics (e.g., Newman 2003) and thus networks evolve mechanically following some stochastic process. Such models have been also been applied in economics (see, for example, Jackson and Rogers 2007).

The second stream is based on economic or strategic models of network formation that explain how decisions of individuals lead to the social networks. Literature in this area started with theoretical contributions by Myerson (1977) and Jackson and Wolinsky (1996) and attracted some interest in economics. Based on these ideas, experimental economists tested out theories of network formation in laboratory experiments with small groups of subjects (e.g., Deck and Johnson 2002, Falk and Kosfeld 2003). While such experiments present a useful technique for analyzing economic questions by controlling for variables (such as costs, information and valuations) that could possibly influence decision making, the size of networks must be rather small to keep the experiment manageable.

Recently, first results have been published that show how real-life social networks emerge and examine determinants of the network formation process. Mayer and Puller (2008) use data from Facebook and develop a model of the formation of social networks that decomposes the formation of social links into effects based upon the exogenous school environment and effects of endogenous choice arising from preferences for certain characteristics in one's friends. Likewise Putzke et al. (2010) test different theories from sociology (e.g., transitivity, reciprocity, and homophily) on network formation with data from a virtual world. Their results indicate that structural effects and demographic variables active in the real world influence the formation of the players' network in the virtual world.

In a business setting, Bandiera et al. (2008) present evidence on the social capital in one particular firm, as embodied in the friendship ties among its workers, and examine the determinants of social ties. We refer to Mayer (2009) for further details on how economists study social networks. We are, however, not aware of any study that examines the effect of conspicuous consumption on the network formation in any setting.

Social Network Analysis

In social network analysis the term of prestige is used to describe a node's centrality in a directed network. "Degree Prestige" measures for example the number of incoming ties divided by the number of actors in the social network. If the network is undirected, the term "prestige" is commonly replaced by centrality which determines the relative importance of a subject in the social network.

We measure the centrality of a subject by two broadly applied measures in social network analysis (Freeman 1979), degree centrality and eigenvector centrality:

Degree Centrality: Let a_{ij} equal 1 if there is a relationship between subject i and j . The degree of i is given by:

$$C_D(i) = \sum_{j \neq i} a_{ij}$$

A subject's degree is calculated simply in terms of the number of others (e.g., friends, family, and co-workers) with whom he/she maintains a direct communication relationship.

For further details, we refer to the literature on social network analysis (Scott 2000; Freeman et al. 1991; Wasserman and Faust 1994). Degree centrality is a basic local concept of centrality. It is often used as a measure for social status since people intuitively infer their social position within their neighborhood. We therefore focus on degree centrality as a measure for social status in our empirical study which is in line with previous research (e.g., Wasko and Faraj 2005).

As a robustness check, we use eigenvector centrality. Bonacich (1972) suggested that the eigenvector of the largest eigenvalue of an adjacency matrix could make a good network centrality measure. Eigenvector centrality measures the importance of a node in a network. It assigns relative scores to all nodes in the network based on the principle that connections to high-scoring nodes contribute more to the score of the node in question than equal connections to

low-scoring nodes. Unlike degree centrality, which weights every contact equally, eigenvector centrality weights contacts according to their centralities.

Eigenvector Centrality: Let $G(E, V)$ be a graph, consisting of vertices V and edges E . Let A be the adjacency matrix for this $G(E, V)$; a_{ij} equals 1 if vertices i and j are connected and $a_{ij} = 0$ otherwise. The eigenvector centrality of a vertex x is proportional to the sum of the centralities of the vertices to which it is connected and is given by:

$$Ax = \lambda x, \quad \lambda x_i = \sum_{j=1}^n a_{ij} x_j, \quad i = 1, \dots, n$$

where λ is the largest eigenvalue of A and n is the number of vertices.

Empirical Study

Study Setup

In order to achieve the goal of our study, it is necessary to examine the effect of conspicuous consumption on the development of social status. As mentioned in the previous section, we first use degree centrality as proxy for social status. Subjects with high degree centrality own high social status and can utilize this social position in a number of situations as outlined in the section on previous research. That is more or less also the idea of “networking.”

We use data from an online community, a virtual world, named Habbo (previously called HabboHotel). The service began in 2000 and has expanded to include 31 online communities and as of January 2010 over 162 million avatars have been registered. There are on average 16.5 million unique visitors monthly and the average duration of visit is 43 minutes. 90% of the users are between 13 and 18 years old (Sulake 2010).

Habbo’s main revenues are generated through the sales of virtual products. These products are furniture-like items and can be used by the buyer to personalize her chat-room. Buying such items is thus conspicuous to other members of the community. Some pieces of furniture are common; basic items such as wallpaper are always available in the catalogue. However, some items are more expensive and are only available for a particular period. These items typically attract more people and astonish other players. Anecdotal evidence suggests that such items are associated with higher social status. In one hilarious example, Lehdonvirta (2009) reports that in the virtual game Ultima Online,

“... one of the most highly valued virtual items in the whole system was a small brown lump named “horse dung”. Despite its very modest appearance and complete lack of performance or functionality, people have paid the equivalent of hundreds of U.S. dollars for the item. The reason is that in Ultima Online, horse dung is extremely rare... ... owning one of these was a status symbol, akin to owning a diamond in the real world.” (p. 11)

In a similar example from Habbo, Lehdonvirta recounts examples of non-functional virtual record players and “Plastyk chairs” which were valued at approximately US \$290 (Lehdonvirta 2009).

The operator of Habbo, the Finish Sulake Corporation, provided us with data for a particular period where new kitchen furniture items (i.e. products) were introduced (Figure 1 illustrates a kitchen in Habbo with the particular kitchen items). We focus in this study on the German Habbo community which is a large country-based community. The new kitchen furniture items were introduced to the community on 2009-09-04 and available only until 2009-09-21. These new kitchen furniture items were thus only available during a limited time period, were quite expensive and therefore considered rare items.

We also collected data on other items that were sold during this period. Further, we acquired data on some player characteristics such as birth date and date of first login and we have access to data on the number and duration of visits during this period.

Very crucial for our analysis is data on the social network amongst the players and its development during the observation period. We therefore made a database snapshot of the friendships data table at the beginning and at the end of the sales period for these new kitchen furniture items (i.e. on 2009-09-04 and 2009-09-21). Friendship is bidirectional, so if player A chooses to be friend of B and B confirms it, the relationship is stored to the database. Unfortunately, we do not know who initiated the friendship. Such bidirectional relationship data can be found in a number of Web 2.0 applications, such as Facebook, LinkedIn or various instant messengers.

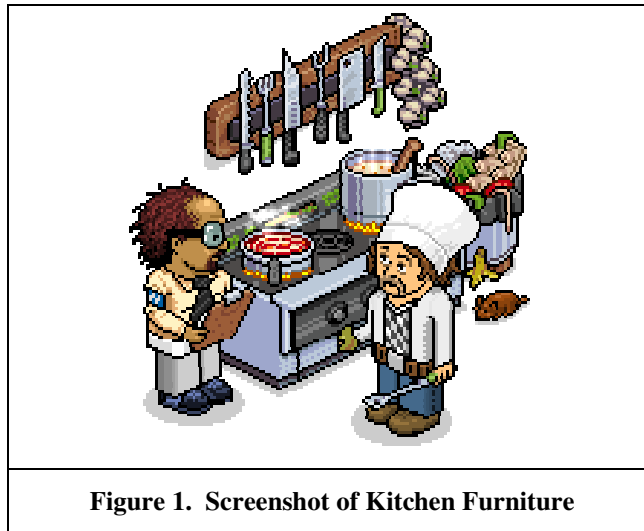


Figure 1. Screenshot of Kitchen Furniture

Descriptive Statistics

The German Habbo has 1,520,025 registered avatars and we observe about 28 million friendship relationships between them. The average degree centrality is thus about 18.4. However, there are a large number of inactive avatars; during the observation period we observe 135,374 active players. This study focuses on the active players and their network and we thus use the activity criteria for our boundary specification strategy (Laumann et al. 1989). The average degree centrality of the active players in this period is about 52 while the standard deviation is 62. We observe a very high number of avatars that own no or very few friends and there are very few players that have more than 200 friends. The degree centrality depicted in Figure 2 thus follows a power law and depicts a scale-free network (see Barabási and Albert 1999).

Overall, 22,037 players purchased virtual items and generated 190,204 transactions. This means that only a small fraction of players invested money but purchased on average more than 8 items. We are not allowed to report the revenue generated by these transactions due to a non-disclosure agreement but substantial revenue was generated in this period. The 190,204 transactions consisted mainly of basic furniture but included the specific new kitchen furniture items that were only available for a limited time period and thus can possess the characteristics of Veblen or prestige goods. We focused our analysis on these new kitchen furniture items and observe that 2,883 of these prestige goods were sold.

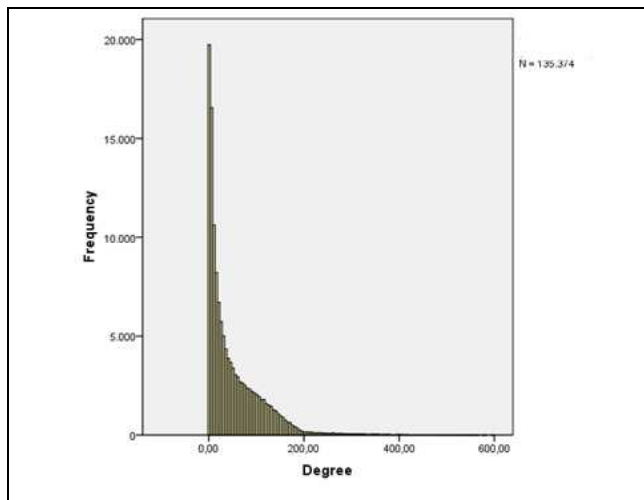


Figure 2. Distribution of Degree Centrality

In the 17 days of our observation period, players spent on average about 5 hours in the online community and visited the community about 8.6 times, so about every second day. Table 1 summarizes the descriptive statistics.

# Total Players incl. inactive (based on data from 2009-09-04)	1,520,025
# Total Friendships incl. amongst & to inactive (2009-09-04)	28,047,488
# Active Players (=Boundary Specification)	135,374
# Friendships (in bounded Network)	7,002,709
# Purchases	190,204
# Purchasers	22,037
# Purchased Prestige Goods	2,883
Average Time Active (in hours)	4.96
Average # Visits	8.58
Average Degree Centrality	51.7
Average Normalized Eigenvector Centrality	8.95E-07

We analyze the development of the network from the start date (2009-09-04) until the end date (2009-09-21). The number of active players increased by +18.3%. The number of friendships also increased as well, but less pronounced, by +9.5%. Due to the high number of new players in this period the average degree centrality decreased by -7.4%. Eigenvector centrality is usually normalized such that the sum of the eigenvector centrality of all nodes is 1. Since we do not want to mix up the eigenvector centrality with the growth of the network, we use a normalized eigenvector centrality multiplied with the size of the network, which we call EVC subsequently. The average EVC increases by 7.1%. Table 2 summarizes the development of the social network.

	2009-09-04	2009-09-21	Change
# Active Players	135,374	160,134	+18.3%
# Friendships	7,002,709	7,666,985	+9.5%
Avg. Degree Centrality	51.7	47.9	-7.4%
Avg. EVC	.70	.75	+7.1%

If we look at the development of the social network a little closer and analyze different types of players we observe the following: On average players who buy goods can increase their degree centrality from 79.2 to 80.3. In comparison players who buy the prestige goods of our analysis, increase their degree centrality from 92.4 to 98.0 on average. This is an increase of +6.1%. Obviously, new players are not that experienced and probably not as likely to buy virtual items for real money. We therefore restrict this first descriptive analysis on players who were also active before the observation period. We see that these players on average increase their degree centrality by about +8.1% which is something like a “normal” growth rate. Players buying products increase their degree centrality by +13.1%

and buyers of the prestige goods from the kitchen furniture increase their degree centrality by even +14.5% and win about 13 new friends in the observation period (see Table 3). The development of the EVC shows a similar pattern.

		<i>Total</i>	<i>All Buyers</i>	<i>Buyers of Prestige Goods</i>
Total Player Base	Avg. Degree Centr.	51.7→47.9 (-7.4%)	79.2→80.3 (+1.4%)	92.4→98.0 (+6.1%)
	Avg. EVC	0.70→0.75 (+7.1%)	1.72→2.08 (+20.9%)	2.09→2.68 (+28.2%)
Only Existing Players	Avg. Degree Centr.	51.7→55.9 (+8.1%)	79.2→89.6 (+13.1%)	92.4→105.8 (+14.5%)
	Avg. EVC	0.70→0.84 (+20.0%)	1.72→2.26 (+31.4%)	2.09→2.83 (+35.4%)

The results reported in the previous tables show that the social status develops differently for different types of players. This development is not necessarily an evidence for a growth in social status due to conspicuous consumption, it can certainly be a result of players’ characteristics or activity level. The higher social status at the start already indicates self-selection. We will analyze the data therefore with more appropriate methods in the following and test whether conspicuous consumption can win you more “friends” and increase thereby social status.

The Effect of Prestige Goods on Social Status

The descriptive analysis depicts that the buyers of the prestige good can increase their social status (see Table 3). However, this result can be biased due to self-selection effects (Hitt and Frei 2002), namely that more active and attractive players who tend to increase their social status due to their characteristics buy the new kitchen furniture items. If this is the case, then the reported increase in social status (Table 3) could not solely be attributed to the purchase of the prestige good. Therefore, we have to separate such a potential self-selection effect from the “treatment” effect of buying the prestige good on a player’s social status.

In order to isolate the effect of prestige good purchase on social status, we use the propensity-score matching methodology (Rosenbaum and Rubin 1983). The central idea of the propensity-score matching methodology is to create matching pairs between treated subjects and non-treated subjects which solely differ in the treatment variable but not with respect to observed covariates. Therefore, we first create matching pairs between players who bought the prestige good and those who did not, i.e., find a comparable player who did not buy for each player who bought based on observable characteristics. Second, we compare the social status of the two groups to measure the isolated effect of prestige good purchase on social status.

In order to create matching pairs, we estimate players’ propensity to buy the prestige good based on observable player characteristics. As such, we use the observable characteristics of online time in the community (in seconds) and number of visits during the time of our study, players’ age and their membership duration (in days) in the online community. Table 4 depicts the results of the propensity score matching: the propensity to buy the prestige good increases by a player’s online time, number of visits, age and membership duration.

	Coefficients	Std. Err.	p-val.
Activity [ln(active seconds)]	.3171	.0089	.000
# Visits	.0020	.0005	.000
Age	.0032	.0010	.002
Membership duration	.0002	.0000	.000
Intercept	-5.2841	.0874	.000
Probit Regression. Dependent variable: Prob. of purchase of prestige good. No. of obs. = 132,008			

Next, we use player’s propensity score to create matching pairs (i.e., finding comparable non-purchasing players to purchasing players based on a similar propensity score). We use the Kernel matching procedure. Kernel matching accounts for all players from the non-purchase group as a potential matching partners but weights them according to their propensity score (Froelich 2004). Finally, we compare the effect of purchasing the prestige good on the change in social status (i.e., change in degree centrality) between purchasers and the matched sample.

Table 5 depicts the results of purchasing the prestige good on the change in degree centrality for the unmatched as well as matched comparison. Without controlling for self-selection effects, the impact of prestige good purchase on degree change is overestimated (see second row of Table 5). However, even then controlling for self-selection effects, we find that the purchase of the prestige good significantly increases a player’s social status by increasing his or her degree centrality by on average eight friends (see third row of Table 5). Thus, conspicuous consumption apparently can buy you “friends”. The results for the degree centrality and EVC are consistent and show the robustness of our findings (see Table 5).

Table 5. Effect of Prestige Good Purchase on Degree Centrality

Sample	Treated	Controls	Difference	Std. Err.	T-stat
Unmatched-DC	13.2119	3.7994	9.4125	.3802	24.76
Matched-DC	13.2119	5.3050	7.9069	.8030	9.85
Unmatched-EVC	.7198	.1290	.5908	.0130	45.58
Matched-EVC	.7198	.1940	.5258	.0326	16.13

Note: Kernel Matching

Conclusion and Future Research

Based on data of a virtual environment, we study the effect of conspicuous consumption on social status. We separate the selection effect (e.g., more active/attractive players buy prestige goods) from the treatment effect (e.g., buying prestige goods increases social status) by creating matching pairs based on observable characteristics; in other words, we find a comparable player who did not engage in conspicuous consumption for each player who conspicuously consumed. Even if we apply this matching method, our results reveal a significant and large effect of conspicuous consumption on status improvement. A subject who is conspicuously consuming wins on average 13.2 friends while his matching twin wins only 5.1 friends over the same time period. An owner of a prestige good signals wealth, social status and might also serve as expert for the virtual community or in reality as an expert for social life. This attracts people and social ties might evolve out of following conversations.

This study analyses the impact of prestige good purchase on social status in a virtual community where friendship is a binary distinction. In the real world, friendship is rather a latent construct as is social capital. Therefore our data are operationalizations of these latent constructs only but we expect them to be valid proxies. We expect a similar effect of prestige good purchases on social status in the real world. From a strict utility-maximizing perspective, it can thus be rational for subjects to conspicuously consume if this investment in social status can be monetarized later. This effect might also explain why luxury brands have been so successful over a long period of time.

From a classic microeconomic perspective it does not make sense for a subject to buy expensive goods that provide no additional utility compared to a less expensive equivalent good. However, it has been reported in many studies that subjects conspicuously consume prestige goods. Actually the entire luxury brand industry with its 80 billion USD yearly revenue builds upon this phenomenon and it is thus important to learn more about this behavior.

If one agrees with Granovetter (1983) that economic life is embedded in the social environment and thus subjects should not be treated atomically, then conspicuous consumption might make sense for a consumer. Consumers increase their status by showing their consumption and improve their social position in their environment. Previous literature and business practice has implicitly agreed upon this effect, but this effect has not yet been tested with real transaction data.

We focus on the number of friends (which is called degree centrality in social network analysis) and EVC as measures for social capital and social status and find that conspicuous consumption indeed improves the social position. In our study we observe, that players who buy extremely rare and expensive items win 2.5 times more friends than comparable players that own the same characteristics.

Previous research has shown that a better social position can help subjects to acquire more valuable information and find for example better jobs or place better bids in auctions. The concept of “networking” builds upon this idea and it might thus be rational and utility-maximizing for subjects to buy luxury goods. The utility comes indirectly from social status that is increased by the conspicuous consumption of the luxury good. Our results are a very first empirical evidence for this claim.

Some economists argue that conspicuous consumption is a collective-action problem, like an arms race. The more the peers spend, the more the focal subject must spend just to stay even (Frank 2000). This is also implicitly described by the colloquial term for conspicuous consumption, “keeping up with the Joneses”. This pursuit of individual self-interest may leave everyone worse off and thus progressive indirect taxes are proposed for consumption. These analyses, however, do not incorporate that due to consumption social capital may be increased and therefore the relationship is most likely more complex than previously outlined.

Our study has three limitations: First, we cannot fully identify the causality. We apply the matching procedure, which has been shown useful in many other similar contexts, to separate the selection effect from the treatment effect but other unobserved characteristics might drive the result as well. Only a randomized experiment could unambiguously solve the question whether conspicuous consumption influences social status. Our results are, however, the first empirical evidence for status improvement by conspicuous consumption which has been a hypothesized driver for conspicuous consumption for more than 100 years. Second, our study is limited to one country and the observed effect may only occur in certain cultures. A cross-culture analysis would help to examine cultural differences. Third, the data allows only to proof whether the social status which is accrued to the avatar in the virtual world may or may not then translate to the individual in the real world (Spann et al. 2010).

Avenues for future research are as already outlined cross-cultural studies. Phenomena like the Veblen effect are likely to depend on cultural norms. In some societies conspicuous consumption is well-accepted whereas it may be disliked in some other countries and the effect on status through conspicuous consumption might even turn negative.

Additional research might also address the question which types of persons are positively influenced by others’ conspicuous consumption. While there is some literature on the characteristics of the influencers, the so called “snobs,” less is known about the addressees of such consumption. A more detailed analysis on the network level might deliver new insights. As an additional explaining variable, researchers should look at the effect of clustering. We would expect that the effect of conspicuous consumption on status improvement is higher when the focal ego’s network is more densely clustered. Thus the clustering coefficient might also be an interesting metric to explain the effect of conspicuous consumption.

Our study also illustrates that virtual environments and their data can be extremely valuable to examine and understand consumer behavior. Whenever effects of social contagion are of interest, data on relationship, communication and transaction behavior from online environments can help to understand these effects. Such data is often stored in easy analyzable formats in databases or can be reconstructed from other sources like conversation protocols. The analysis gets tricky when large amounts of data have to be filtered or must be condensed to an analyzable size. We expect that more studies will benefit from data from virtual communities and we expect that researchers from economics and marketing will also start to make use of this new data opportunity.

Acknowledgements

We thank Sulake Finland for providing the dataset and Ju-Young Kim for helpful comments. We further thank the anonymous referees, the associate editor and the editors for their helpful remarks.

References

- Amaldoss, W., Jain, S. "Conspicuous Consumption and Sophisticated Thinking," *Management Science* (51:10), October 2005a, pp. 1449-1466.
- Amaldoss, W., Jain, S. "Pricing of Conspicuous Goods: A Competitive Analysis of Social Effects," *Journal of Marketing Research* (42:1), 2005b, pp. 30-42.
- Bagwell, L.S., Bernheim, B.D. "Veblen Effects in a Theory of Conspicuous Consumption," *American Economic Review* (86:3), June 1996, pp. 349-373.
- Bampo, M., Ewing, M., Mather, T., Dineli R., Stewart, D., Wallace, M. "The Effects of the Social Structure of Digital Networks on Viral Marketing Performance," *Information Systems Research* (19:3), September 2008, pp. 273-290.
- Bandiera, O., Barankay, I., Rasul, I. "Social capital in the workplace: Evidence on its formation and consequences," *Labour Economics* (15:4), August 2008, pp. 724-748.
- Barabási, A.L., Albert, R. "Emergence of Scaling in Random Networks," *Science* (286:5439), October 1999, pp. 509-512.
- Bearden, W.O., Netemeyer, R.G., Teel, J.E. "Measurement of Consumer Susceptibility to Interpersonal Influence," *Journal of Consumer Research* (15:4), March 1989, pp. 473-481.
- Becker, G. "A Note on Restaurant Pricing and Other Examples of Social Influences on Price," *Journal of Political Economy* (99:5), January 1991, pp. 1109-1116.
- Belk, R.W. "Possessions and the Extended Self," *Journal of Consumer Research* (15:2), September 1988, pp. 139-168.
- Bertrand, M., Luttmer, E.F.P., Mullainathan, S. "Network Effects and Welfare Cultures," *Quarterly Journal of Economics* (115:3), 2000, pp. 1019-1055.
- Braun, O.L., Wicklund, R.A. "Psychological Antecedents of Conspicuous Consumption," *Journal of Economic Psychology* (10:3), November 1989, pp. 161-187.
- Brewer, M.B. "The Social Self: On Being the Same and Different at the Same Time," *Personality and Social Psychology Bulletin* (17:5), October 1991, pp. 475-482.
- Burt, R.S. "Social Contagion and Innovation: Cohesion Versus Structural Equivalence," *American Journal of Sociology* (92:6), 1987, pp. 1287-1335.
- Burt, R. "Structural Holes: The Social Structure of Competition", Mass: Harvard University Press, Cambridge, 1992.
- Calvó-Armengol, A., Verdier, T., Zenou, Y. "Strong and Weak Ties in Employment and Crime," *Journal of Public Economics* (91:1-2), February 2007, pp. 203-233.
- O'Cass, A., Frost, H. "Status Brands: Examining the Effects of Non-Product-Related Brand Associations on Status and Conspicuous Consumption," *Journal of Product & Brand Management* (11:2), 2002, pp. 67-88.
- Chao, A., Schor, J.B. "Empirical Tests of Status Consumption: Evidence from Women's Cosmetics," *Journal of Economic Psychology* (19:1), February 1998, pp. 107-131.
- Coleman J. S. "Social Capital in the Creation of Human Capital," *American Journal of Sociology* (94), 1988, pp. 95-121.
- Corneo, G., Jeanne, O. "Conspicuous Consumption, Snobbism and Conformism," *Journal of Public Economics* (66:1), October 1997, pp. 55-71.
- Deck, C., Johnson, C. "Link Bidding in a Laboratory Experiment," *Review of Economic Design* (8:4), April 2004, pp. 359-372.
- Donnenwerth, G.V., Foa, U.G. "Effect of Resource Class on Retaliation to Injustice in Interpersonal Exchange," *Journal of Personality and Social Psychology* (29:6), June 1974, pp. 785-793.
- Eastman, J.K., Goldsmith, R.E., Flynn, L.R. "Status Consumption in Consumer Behavior: Scale Development and Validation," *Journal of Marketing Theory and Practice* (7:3), 1999, pp. 41-52.
- Falk, A., Kosfeld, M. "It's all about Connections: Evidence on Network Formation", *IZA Discussion Paper No. 777*, 2003.
- Frank, R. "The Demand for Unobservable and Other Nonpositional Goods," *American Economic Review* (75:1), March 1985, pp. 101-116.
- Frank, R. "Luxury Fever: Money and Happiness in an Era of Excess", Princeton University Press, United States, 2000.
- Freeman, L.C. "Centrality in Social Networks: Conceptual Clarification," *Social Networks* (1:3), 1979, pp. 215-239.

- Freeman, L.C., Borgatti, S.P., White, D.R. "Centrality in Valued Graphs: A Measure of Betweenness Based on Network Flow," *Social Networks* (13:2), 1991, pp. 141–154.
- Froelich, M. "Finite-Sample Properties of Propensity-Score Matching and Weighting Estimators," *The Review of Economics and Statistics* (86:1), February 2004, pp. 77-90.
- Gladwell, M. "The Tipping Point – How Little Things Can Make A Big Difference", Little Brown, United States, 2000.
- Glaeser, E.L., Laibson, D., Scheinkman, J.A., Soutter, C.L. "Measuring Trust," *Quarterly Journal of Economics*, (115:3) August 2000, pp. 811-846.
- Granovetter, M. "The Strength of Weak Ties," *American Journal of Sociology* (78:6), May 1973, pp. 1360–1380.
- Granovetter, M. "Getting A Job: A Study of Contacts and Careers", Mass: Harvard University, Cambridge, 1974.
- Goldenberg, J., Han, S., Lehmann, D., Hong, J.W. "The Role of Hubs in the Adoption Processes," *Journal of Marketing* (73:2), March 2009, pp. 1-13.
- Hinz, O., Spann, M. "The Impact of Information Diffusion on Bidding Behavior in Secret Reserve Price Auctions," *Information Systems Research* (19:3), September 2008, pp. 351-368.
- Hitt, L.M., Frei F.X. "Do Better Customers Utilize Electronic Distribution Channels? The Case of PC Banking," *Management Science* (48:6), June 2002, pp. 732–748
- Hopkins, E., Kornienko, T. "Running to Keep in the Same Place: Consumer Choice as a Game of Status," *American Economic Review* (94:4), September 2004, pp. 1085-1107.
- Jackson, M.O., Wolinsky, A. "A Strategic Model of Social and Economic Networks," *Journal of Economic Theory* (71:1), 1996, pp. 44-74.
- Jackson, M.O. "The Economics of Social Networks, Advances in Economics and Econometrics, Theory and Applications", in: Richard Blundell, Whitney Newey, Torsten Persson (Eds.), Ninth World Congress of the Econometric Society, vol. 1, Cambridge University Press, 2006.
- Jackson, M.O., Rogers, B.W. "Meeting Strangers and Friends of Friends: How Random are Social Networks?," *American Economic Review* (97:3), 2007, pp. 890-915.
- Jones, S. "Economics of Conformism", Blackwell, Oxford, 1984.
- Karni, E., Levin, D. "Social Attributes and Strategic Equilibrium: A Restaurant Pricing Game," *Journal of Political Economy* (102:4), January 1994, pp. 822-840.
- King, G., Zeng, L. "Logistic Regression in Rare Events Data," *Political Analysis* (9:2), 2001, pp. 137-163
- Laumann, E.O., Marsden, P.V., Prensky, D. "The Boundary Specification Problem in Network Analysis", in *Research Methods in Social Network Analysis*, Freeman, L.C., White, D.R., Rommney, A.K. (Eds.), Mason University Press, Fairfax, VA, 1989, pp. 18-34.
- Lehdonvirta, V. "Virtual item sales as a revenue model: identifying attributes that drive purchase decisions," *Electronic Commerce Research* (9:1-2), June 2009, pp. 97–113.
- Leibenstein, H. "Bandwagon, Snob, and Veblen Effects in the Theory of Consumers' Demand," *Quarterly Journal of Economics* (64:2), May 1950, pp. 183-207.
- Lin, N. "Social Networks and Status Attainment," *Annual Review of Sociology* (25), August 1999, pp. 467-487.
- Linton, R. "The study of man", Appleton-Century-Crofts, New York, 1936.
- Mason, R. "Conspicuous Consumption: Literature Review," *European Journal of Marketing* (18:3), 1984, pp. 26-39.
- Mayer, A. "Online Social Networks in Economics," *Decision Support Systems* (47:3), June 2009, pp. 169-184.
- Mayer, A., Puller, S. L. "The old Boy (and Girl) Network: Social Network Formation on University Campuses," *Journal of Public Economics*, 92 (1-2), February 2008, pp. 329-347.
- McGuire, W. "Personality and Susceptibility to Social Influence", in *Handbook of Personality: Theory and Research*, Borgatta, E., Lambert, W. (Eds.), Rand McNally, Chicago, 1968, pp. 1130-1187.
- McMillan, J., Woodruff, C. "Interfirm Relationships and Informal Credit in Vietnam," *Quarterly Journal of Economics* (114:4) , 1999, pp. 1285-1320.
- Montgomery, J. "Social Networks and Labor Market Outcomes: Towards an Economic Analysis," *American Economic Review* (81:5), December 1991, pp.1408-1418.
- Myerson, R. "Graphs and Cooperation in Games," *Mathematics of Operations Research*, (2:3), 1977, pp. 225-229.
- Navon, A., Shy, O., Thisse, J.F. "Product Differentiation in the Presence of Bandwagon Effects", Mimeo, Ceras, Paris, 1995.
- Newman, M. "The Structure and Function of Complex Networks," *Society for Industrial and Applied Mathematics Review* 45 (2), 2003, pp. 167–256.
- Oestreicher-Singer, G., Sundararajan, A. "The Visible Hand of Social Networks in Electronic Markets," *Proceedings of the INFORMS Conference on Information Systems and Technology*, November 2008.

- Pesendorfer, W. "Design Innovation and Fashion Cycles," *American Economic Review* (85:4), September 1995, pp. 771-792.
- Portes A. "Social capital: Its Origins and Applications in Modern Sociology," *Annual Review of Sociology* (24), August 1998, pp. 1-24.
- Portes A., Sensenbrenner J. "Embeddedness and Immigration: Notes on the Social Determinants of Economic Action," *American Journal of Sociology* (98:6), 1993, pp. 1320-1350.
- Putzke J., Fischbach K., Schoder D., Gloor, P.A. "The Evolution of Interaction Networks in Massively Multiplayer Online Games," *Journal of the Association for Information Systems* (11:2), 2010, pp. 69-94.
- Rosenbaum P., Rubin D. "The Central Role of the Propensity Score in Observational Studies for Causal Effects," *Biometrika* (70:1), 1983, pp. 41-55
- Ross, L., Bierbrauer, G., Hoffman, S. "The Role of Attribution Processes in Conformity and Dissent: Revisiting the Asch Situation," *American Psychologist* (31:2), February 1976, pp. 148-157.
- Scott, J. "Social Network Analysis: A Handbook", Sage, London, 2000.
- Spann, M., Hinz, O., Hann, I.-H., Skiera, B. "The Validity of Decision Making in Virtual Worlds: An Experimental Test of Altruism, Fairness, and Presence," *European Conference on Information Systems (ECIS)*, Pretoria, 2010.
- Sundararajan, A. "Network Seeding", *Extended Abstract for WISE 2006*, NYU Stern School of Business, New York, 2006.
- Sulake 2010: "Habbo - Where else? - Sulake". Sulake Corporation Ltd. January 2010. <http://www.sulake.com/habbo>. Retrieved 2010-04-09.
- Teo, H.H., Wei, K.K., Benbasat, I. "Predicting Intention to Adopt Interorganizational Linkages: An Institutional Perspective," *MIS Quarterly* (27:1), March 2003, pp 19-50.
- Tian, K. T., Bearden, W.O., Hunter, G.L. "Consumers' Need for Uniqueness: Scale Development and Validation," *Journal of Consumer Research*, (28:1), June 2001, pp. 50-66.
- Trusov, M., Bodapati, A., Bucklin, R.E. "Determining Influential Users in Internet Social Networks," *Journal of Marketing Research*: forthcoming 2010.
- Wasko, M.M., Faraj, S. "Why should I share? Examining Social Capital and Knowledge Contribution in Electronic Networks of Practice," *MIS Quarterly* (29:1), March 2005, pp. 35-57.
- Wasserman, S., Faust, K. "Social Network Analysis: Methods and Applications", New York: Cambridge University Press, Cambridge, 1994.