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Inconspicuous Conspicuous Consumption

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Abstract

A puzzling feature of conspicuous consumption, given its role in signaling wealth, is that it is not *more* conspicuous. For example, luxury handbags are often available in multiple variants that differ in logo visibility; in fact, subtly branded handbags are often *more* expensive than their loudly branded equivalents. Why may consumers prefer to deliberately obfuscate their conspicuous consumption? Our explanation is that by being imperfectly visible, subtly conspicuous consumption signals social connectedness in addition to wealth. We analyze a model where individuals care about their reputation for both wealth and social connectedness. Wealthy but poorly-connected individuals consume loudly conspicuous goods because subtle consumption is too costly in foregone wealth signaling. Wealthy, well-connected individuals consume subtly to distinguish themselves from poorly-connected individuals. The model thus explains why "old-money" types prefer to consume subtly, whereas "nouveau riche" types tend to consume loudly. Further, the model predicts that more subtle consumption takes place in societies where social capital is more important. It also explains recent empirical findings from the marketing literature that subtly-branded luxury goods tend to be more expensive than their loudly-branded equivalents.

Keywords: conspicuous consumption, signaling, Veblen goods.

JEL Classification Numbers: D11, D43.

1 Introduction

In his classic critic of the Gilded Age, Veblen (1899) introduced the idea that conspicuous spending serves as a costly signal of wealth. Subsequently, a number of papers (e.g. Bagwell and Bernheim (1996), Charles et al. (2009), etc.) have modeled conspicuous consumption as the equilibrium outcome of a signaling game. In these models, wealthy individuals consume what we call *Veblen goods*: expensive goods that have cheaper functional substitutes. They do so to distinguish themselves from poor individuals, for whom such consumption is prohibitively costly. Veblen gives the example of hand-made silverware: "A hand-wrought silver spoon ... is not ordinarily more serviceable...than a machine-made spoon of the same material."

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Yet the example of silverware highlights a puzzling aspect of conspicuous consumption: it is often *subtle*, in the sense that it is difficult for others to observe and recognize. For example, hand-wrought silverware only signals wealth to dinner guests. Someone who wishes to signal his wealth as clearly as possible can do better: Bagwell and Bernheim (1996), acknowledging this puzzle, suggest "[publishing] tax returns or audited asset statements".

This paper presents an equilibrium explanation for the subtlety of certain Veblen goods. We begin with the premise that individuals are interested in begin recognized as of high social status, and argue that individuals engage in subtly conspicuous consumption to simultaneously signal wealth *and* social connectedness —both primary components of social status. Consider the following illustrative example. Tom is wealthy and socially well-connected. He can distinguish himself from poor individuals by consuming costly Veblen goods; for example, he might purchase an expensive car to drive around town in. However, if Tom seeks to demonstrate to observers that he is socially well-connected as well as wealthy, his consumption choice also has to distinguish him from wealthy, poorly-connected individuals. In fact, Tom may purchase an expensive painting for display in his living room; it would then be observed only by guests at Tom's house. Tom's guests, observing the painting and noting that only Tom's guests ever observe the painting, infer that Tom is well-connected, because using this painting as a signal of Tom's type is cost-effective only if Tom's parties are well-attended.

This story captures the key logic of our theory, and emphasizes the notion that imperfectly observable Veblen goods may serve to signal social connectedness. Specifically, such Veblen goods are relatively easy to observe only in the course of social interaction, and relatively difficult to observe (and recognize the nature of) by an observer who is not interacting socially with the consumer. We identify such Veblen goods as *subtle*; whereas *loud* Veblen goods (e.g., an expensive, flashy car or handbag) are those that are easily observed and recognized regardless of whether the observer is closedly interacting with the consumer.

We develop a simple model where a consumer seeks to simultaneously influence an observer's perception of his wealth and social connectedness. The consumer can choose between a *loud* Veblen good and a *subtle* Veblen good, he can also choose a non-consumption option. The loud good is always recognized by the observer, while the subtle good may sometimes be mistaken for non-consumption; the observer is more likely to successfully discern the subtle good from non-consumption if the consumer is better-connected. A natural interpretation of this assumption is that the observer is more likely to be engage in social interaction (and thus clearly discern the consumer's consumption choice) with a well-connected consumer.

The key prediction of the model is that wealthy, well-connected individuals consume subtly, whereas wealthy, poorly-connected individuals consume loudly. To highlight the power of this result, consider three examples of consumption patterns in various settings:

Old Money versus Nouveau Riche Conventional wisdom often associates loud consumption with the *nouveau riche*: people who have recently become wealthy. On the other hand, subtle consumption is associated with *old money*: people whose wealth has been in the family for generations. Our interpretation is that old money types are socially well-connected as they have been able to develop social connections over time, whereas the nouveau riche, having recently acquired wealth, do not have many relevant social connections. A striking example of this consumption pattern is found in Beal (2000), who categorizes wealthy Jordanian households into "two distinct and conflicting factions – old-money elites whose wealth was established prior to the flood of petrodollars into the country and new-money elites who came by their wealth primarily after 1973." Consistent with our theory's predictions, Beal (2000) describes "old-money" types as consuming subtly, in a way that concealed said consumption from public view: "The villa ... is, in contrast to many of Amman's new villas, located a considerable distance from the road and rather nondescript in exterior appearance ... The sitting room was stuffed full of richly embroidered and gilded furniture." In contrast, she describes the "new money" types as consuming loudly: "The homes of the new elite ... scream their opulence at passers-by ... expensive cars driven in a reckless fashion throughout Amman's residential neighbourhoods."

Branding of Luxury Goods Many luxury goods brands have a product range that encompasses both subtle and loud forms of conspicuous consumption. For example, some handbag models often come in multiple varieties, with loudly conspicuous varieties prominently labeled with the brand logo and subtly conspicuous varieties being subtly marked (if at all). Further, the marketing strategies of these brands often insinuate gently that the subtler varieties of each item signal higher social status. Our theory provides some insight into this phenomenon: the social status accorded to consumers of subtly-branded goods is in fact recognition that these consumers are socially well-connected.

Cultural Consumption versus Material Consumption Many forms of cultural knowledge, such as appreciation of music, art or wine, qualify as subtle Veblen goods in our theory: they (i) require costly investment to acquire, and (ii) can only be observed in the course of social interaction. Our model thus predicts that wealthy, poorly-connected consumers will focus on consumption of loud material goods, whereas wealthy, well-connected consumers will focus on acquisition of cultural capital. This is consistent with the argument in the sociological literature that cultural capital serves as a status symbol; in our theory, cultural capital serves as a credible signal that the consumer is well-endowed with social capital. Further, if we accept the premise that old-money [nouveau riche] types have high [low] connectedness, we may predict that old-money types spend more on cultural consumption than nouveau riche types.

The theory also has implications for the aggregate distribution of Veblen consumption. It predicts that the number of consumers who consume subtly, as a fraction of all consumers of Veblen goods, increases when the value of signaling social connectedness increases. Consequently, loud consumption may be more prevalent (compared to subtle consumption) in social groups where social capital is relatively less valuable. Relatedly, a number of empirical studies have documented differences across ethnic, geographic and cultural groups in the extent of conspicuous consumption.[1] Our distinction between loud

[1]For example, Charles et al. (2009) show that differences in conspicuous consumption across ethnic groups can be attributed to differences in the income distribution of each group.

and subtle Veblen goods suggests a novel perspective on this issue: differences in measured conspicuous consumption across groups may be driven by differences in the nature, rather than the extent, of conspicuous consumption. In particular, standard measures of conspicuous consumption may neglect less tangible forms of subtle consumption such as cultural capital, and thus underestimate the extent of conspicuous consumption in groups that favour subtle consumption.

Finally, we study the pricing implications of our theory. Berger and Ward (2010) and Han et al. (2010) provide evidence that subtly conspicuous goods are more expensive than loudly conspicuous alternatives. Our theory provides a simple economic explanation for this stylized fact. We show that (under an intuitive assumption) a monopolist who sells both a loud good and a subtle good will set a higher price for the subtle good. Well-connected consumers benefit more from signaling their type, and thus are willing to pay more to do so, than poorly-connected consumers. Thus, the monopolist extracts more rents from the well-connected types by setting a higher price for the subtle Veblen good than the overt Veblen good.

There is a significant economic literature on the consumption of Veblengoods, starting with Veblen (1899). Closest to our paper is Feltovich et al. (2002), who introduce the concept of *countersignalling.* In their model, when observers have costless access to a noisy signal about the ability of consumers, high-type consumers may choose not to invest in a separate costly signal (that is correlated with type) in order to separate from medium types. Thus, countersignaling takes the form of *no signal*; in contrast, in our theory, subtle signaling takes the form of an imperfect signal whose observability is a function of social connectedness. Thus subtle Veblen goods fit our theory of subtle signaling, but are not easily explained as countersignaling.

A number of papers explore the price theory of status goods, mainly focusing on settings where care purely about signaling wealth or some generic measure of status. Bagwell and Bernheim (1996) treat the case of perfect competition, and derive conditions under which Veblen effects (i.e. consumption as a signal of wealth) arise. Pesendorfer (1995) considers the dynamic problem faced by a monopolistic producer of status goods and shows how "fashion cycles" may arise in equilibrium due to a Coase-Conjecture-esque effect whereby the monopolist gradually reduces the price of a good, thus increasing its accessibility to the broader population of consumers over time. These analyses are complementary to ours. We focus on a distinct aspect of conspicuous consumption — the observed subtlety of Veblen goods — which these papers do not address, while abstracting from many of the issues that these papers analyze.

Berger and Ward (2010) develop a rich qualitative theory of culturally subtle consumption. Our theory complements and extends theirs in a few key respects. Whereas Berger and Ward (2010) argue that consumers choose different forms of consumption because they target different groups of observers, we argue that differences in consumption are driven not by differing preferences but by differences in levels of social capital across consumers. Also, by emphasizing social interactions in our theory of conspicuous consumption, we identify the key role that subtlety plays. Further, we are able to provide an economic explanation for the empirical finding in Berger and Ward (2010) and Han et al. (2010) that subtly conspicuous goods are more expensive than overtly conspicuous alternatives.

Our model is described in Section 2. We present the main result — that well-connected types consume subtly while poorly-connected types consume loudly — in Section 3. This section also discusses comparative statics for aggregate consumption outcomes in a setting where prices are exogenously specified. We then consider the issue of endogenous prices in Section 4, where consider a monopolist's pricing problem, and show that the monopolist optimally charges more for the subtle good than the loud good. Some proofs are in the Appendix.

2 The Model

Consumers are distinguished by two attributes, *wealth* and *social connectedness*. There is mass $\rho > 0$ of *poor consumers* who have low wealth (w_L) and low social connectedness (θ_L). There is a unit mass of *wealthy consumers* ($w_H > w_L$) who differ in social connectedness — within this subset, the degree of social connectedness is a random variable θ with distribution G and full support $\Theta = [\underline{\theta}, \infty)$, where $\underline{\theta} > 0$. For convenience, we normalize the wealth and social connectedness of poor consumers to be equal to zero.

A consumer (he) is randomly drawn from the population. The consumer may purchase a single unit of either a *loud* Veblen good ($\kappa = \ell$) or a *subtle* Veblen good ($\kappa = s$). We denote the non-consumption option by $\kappa = \varnothing$. Each Veblen good costs $p_\kappa > 0$, non-consumption is costless. Poor consumers choose non-consumption by default (borrowing is not possible in our model).[2] After his purchasing decision is made, the wealthy consumer meets a single observer (she) who can be of two types, *discerning* and *undiscerning*. Both observers recognize the loud Veblen good, but only the discerning observer distinguishes between the subtle Veblen good and the non-consumption option. Formally, both types of observers receive the signal ψ_ℓ (respectively, $\psi_\varnothing$) when the rich consumer selects the loud Veblen good (respectively, non-consumption), but only the discerning observer receives the signal ψ_s when the consumer chooses the subtle Veblen good. In this last case, the undiscerning observer receives the signal $\psi_\varnothing$. The probability that a wealthy consumer with social connectedness $\theta \in \Theta$ encounters a discerning observer is $\eta(\theta) > 0$. We specify that η be an increasing function of θ, with $\eta(\theta) \to 1$ as $\theta \to \infty$, capturing with this specification the premise that well-connected consumers are more likely to encounter discerning observers. Poor unconnected consumers have no chance of meeting a discerning observer, thus we let $\eta(0) = 0$.

In this consumer–observer signaling game, a *strategy* for the wealthy consumer is a mapping σ from Θ to probability distributions over available choices $\{\varnothing, \ell, s\}$. We denote the observer's *conjecture* about the consumer's strategy by μ. The consumer cares about the observer's ex-post evaluation of his wealth and connectedness: he wants to be perceived as wealthy and well-connected. The observer's posterior beliefs depend on (i) her conjecture about the consumer's strategy; and (ii) the signal that she receives.[3] There-

[2] If we relax the borrowing constraint, then we can still ensure that poor agents do not consume visibly by imposing Spence-Mirrlees type conditions on consumer preferences.

[3] We assume that the observer does not consider her own type in making her inference. Think of this as reflecting the premise that the observer uses consumption choice as a simple heuristic to judge the consumer's type. Versions of the model where the observer makes her inference based on both ψ and her type yield similar results. We choose the present formulation as a straightforward way to convey the

fore, the wealthy consumer's *ex-post social payoff*, as a function of signals and observer's conjectures, is given by

$$\pi(\psi, \mu) \;=\; \mathbb{E}\big[w \mid \psi, \mu\big] \;+\; r\,\mathbb{E}\big[\theta \mid \psi, \mu\big], \tag{1}$$

where $r > 0$ is the relative weight assigned to perceptions of social connectedness.

As mentioned above, the distribution of signals depends on the consumption choices and the degree of social connectedness. The expected utility of a wealthy consumer of type θ who purchases $\kappa \in \{\varnothing, \ell, s\}$ is, respectively,

$$u(\varnothing, \theta, \mu) \;=\; \pi(\psi_\varnothing, \mu), \tag{2}$$

$$u(\ell, \theta, \mu) \;=\; \pi(\psi_\ell, \mu) \;-\; p_\ell, \tag{3}$$

$$u(s, \theta, \mu) \;=\; \eta(\theta)\,\pi(\psi_s, \mu) \;+\; (1 - \eta(\theta))\,\pi(\psi_\varnothing, \mu) \;-\; p_s. \tag{4}$$

Note that in the first two cases, the expected utility is a constant function of the social connectedness parameter θ and depends only on the consumer's purchasing decision $\kappa \in \{\varnothing, \ell\}$ and the derived conjecture of the observer via their effect on the social payoffs. To simplify notation we omit θ in the argument and write these expected utilities as $u(\varnothing, \mu)$ and $u(\ell, \mu)$. On the other hand, the expected utility of a wealthy consumer who chooses the subtle good depends on his degree of social connectedness. A higher $\theta \in \Theta$ improves the chances that he will meet a discerning observer. Throughout the paper we maintain the following simplifying assumption.

Assumption 1. Every wealthy consumer of type $\theta \in \Theta$ breaks ties between consumption choices in the same way. In particular, if a consumer is indifferent between some form of conspicuous consumption versus non-consumption, then he always chooses conspicuous consumption.

3 Equilibrium with Exogenous Prices

We focus on equilibria where the consumer's strategy and the observer's inference constitute a Perfect Bayesian Equilibrium, placing no restrictions on out-of-equilibrium beliefs; consequently, the analysis does not establish that the equilibria of interest are unique. In this section, we consider the price of the Veblen goods as exogenous and show that the signaling game between the consumer and the observer admits a PBE for some price configuration. In the next section we consider existence of profit maximizing equilibrium when a monopolist provides both the loud and subtle goods.

3.1 Full Equilibrium

We start by rejecting the possibility that subtle consumption is associated with *low* social connectedness. That is, there is *no* equilibrium where wealthy buyers that are lightly connected consume subtly, whereas their more socially connected peers consume loudly.

essential intuition.

Proposition 1. *Let σ be an equilibrium strategy for the wealthy consumer. If there is some type $\theta > \underline{\theta}$ that chooses $\kappa = s$ with positive probability under σ, then all types $\theta' > \theta$ consume $\kappa = s$ with probability one in equilibrium.*

Proof. Accepting the equilibrium premise that $\sigma(s|\theta) > 0$ for some type $\theta > \underline{\theta}$ and given equilibrium conjecture μ of the observer, we must have $u(s, \theta, \mu) - u(\ell, \mu) \geq 0$ and $u(s, \theta, \mu) - u(\varnothing, \mu) \geq 0$. Using Equation 2 and Equation 4 in the last equilibrium condition, one obtains

$$\eta(\theta)\big[\pi(\psi_s, \mu) \ - \ \pi(\psi_\varnothing, \mu)\big] \ \geq \ p_s \ > \ 0.$$

Since $\pi(\psi_s, \mu) > \pi(\psi_\varnothing, \mu)$, it follows that in this equilibrium $u(s, \cdot, \mu)$ is strictly increasing in the social connectedness parameter. Therefore, for all $\theta' > \theta$,

$$u(s, \theta', \mu) \ > \ u(\ell, \mu) \qquad \text{and} \qquad u(s, \theta', \mu) \ > \ u(\varnothing, \mu).$$

All wealthy consumers with $\theta' > \theta$ strictly prefer subtle consumption to loud consumption and non-consumption, thus $\sigma(s|\theta') = 1$ as claimed. □

The intuition for this equilibrium feature is simple. Consider first the case where the observer believes that consumers who buy the subtle Veblen good have higher expected θ than consumers who buy the loud Veblen good. Because the signaling value of $\kappa = s$ is increasing in θ, as the number of discerning observers in the consumer's social circle increases, the likelihood that subtle consumption will be distinguished from the non-consumption option increases, and so the consumer is more likely to be perceived to have high social status. On the other hand, in equilibrium the signaling value of $\kappa \in \{\varnothing, \ell\}$ is invariant to θ, because either consumption option is recognized by all observers regardless of their own disposition. This means that whenever type θ consumes subtly, all types $\theta' > \theta$ will also consume subtly. Consumers with low social status choose the loud conspicuous consumption option or the non-consumption option, depending on whether the benefit of signaling wealth (but low connectedness) exceeds the cost. Consequently, appealing to Assumption 1, we obtain the following corollary.

Corollary 1. *In any equilibrium strategy σ for the wealthy consumer, there exists $\theta^* \in [\underline{\theta}, \infty]$ such that all wealthy consumers with $\theta < \theta^*$ choose the same option $\kappa \in \{\varnothing, \ell\}$, and all wealthy consumers with $\theta > \theta^*$ choose $\kappa = s$.*

Corollary 1 allows us to classify all possible equilibria of the consumer–observer signaling game. First, there is the case where observers believe that subtle consumption is a signal of low social connectedness, so that wealthy consumers choose to consume either conspicuously or not at all. This corresponds to a equilibrium with $\theta^* = \infty$. The opposite case is one where observers believe that subtle consumption is a signal of high social connectedness, and therefore all wealthy consumers choose the subtle Veblen good. This correspondes to an equilibrium with $\theta^* = \underline{\theta}$. Finally, there are interior equilibria where a positive mass of high status wealthy consumers purchase the subtle good and their less socially connected peers buy the loud Veblen good or not at all. Our focus in this section is on interior equilibria where both loud and subtle conspicuous consumption take place in equilibrium. This type of equilibria allow us to study the tradeoff between subtle and loud consumption in a simple setting.

Definition 1. An equilibrium of the signaling game between the consumer and the observer is said to be a *full equilibrium* if for each Veblen good $\kappa \in \{\ell, s\}$, there is a strictly positive mass of wealthy consumers that choose κ.

In a full equilibrium, all wealthy consumers buy a Veblen good. Were it not the case, there would be some type $\theta \in \Theta$ who prefers the non-consumption option to loud consumption. But since the equilibrium utilities derived from both choices are independent of social connectedness, it follows that no wealthy consumer would buy $\kappa = \ell$, which cannot happen in a full equilibrium by definition. Consequently, in any full equilibrium there exists some $\theta^* \in (\underline{\theta}, \infty)$ such that all types $\underline{\theta} \leqslant \theta < \theta^*$ choose to consumption loudly and all types $\theta > \theta^*$ choose to consumption subtly. A full equilibrium strategy σ for the wealthy consumer is therefore characterized by a threshold type θ^* such that $\sigma(\ell|\theta) = 1$ for all $\underline{\theta} \leqslant \theta < \theta^*$ and $\sigma(s|\theta) = 1$ for all $\theta > \theta^*$. In what follows we restrict attention such *threshold strategies* for the wealthy consumer and corresponding *threshold conjectures* for the observer. With a slight abuse of notation, we denote them by $\sigma(\theta^*)$ and $\mu(\theta^*)$, respectively. We shall describe conditions under which there exists a threshold pair $(\sigma(\theta^*), \mu(\theta^*))$ that constitutes a full equilibrium of the consumer–observer signaling game.

We first write the social payoffs generated by signals ψ_ℓ and ψ_s under threshold conjecture $\mu(\theta^*)$ as follows:

$$\begin{aligned} \pi\left(\psi_\ell, \mu(\theta^*)\right) &= \mathbb{E}\big[w \mid \psi_\ell, \mu(\theta^*)\big] \;+\; r\,\mathbb{E}\big[\theta \mid \psi_\ell, \mu(\theta^*)\big] \\ &= w_H \;+\; r\,\frac{\int_{\underline{\theta}}^{\theta^*} \theta g(\theta)\, d\theta}{G(\theta^*)}, \end{aligned} \tag{5}$$

and similarly

$$\begin{aligned} \pi\left(\psi_s, \mu(\theta^*)\right) &= \mathbb{E}\big[w \mid \psi_s, \mu(\theta^*)\big] \;+\; r\,\mathbb{E}\big[\theta \mid \psi_s, \mu(\theta^*)\big] \\ &= w_H \;+\; r\,\frac{\int_{\theta^*}^{\infty} \theta\, \eta(\theta) g(\theta)\, d\theta}{\int_{\theta^*}^{\infty} \eta(\theta) g(\theta)\, d\theta}. \end{aligned} \tag{6}$$

It is clear from Equation 5 and Equation 6 above that the social payoff of both signals ψ_ℓ and ψ_s is increasing in θ^*. Intuitively, a higher threshold type improves the value of the loud consumption signal as the observer believes a higher proportion of better connected consumers are choosing the loud conspicuous good. But it also improves the value of the subtle signal: once recognized, the observer infers it was generated by highly connected wealthy consumers. Note however that as $\theta^* \to \infty$ the social payoff of ψ_ℓ converges to $w_H + r\mathbb{E}[\theta]$, whereas the social payoff of ψ_s remains unbounded. That is, when everyone except for the very highly connected consumers is buying the loud good, the value of a subtle signal is extremely high.

The consumer's social payoff for signal $\psi_\varnothing$ given threshold conjecture $\mu(\theta^*)$ is

$$\begin{aligned}\pi\left(\psi_\varnothing, \mu(\theta^*)\right) &= \mathbb{E}\big[w \mid \psi_\varnothing, \mu(\theta^*)\big] \;+\; r\,\mathbb{E}\big[\theta \mid \psi_\varnothing, \mu(\theta^*)\big] \\ &= \frac{\int_{\theta^*}^{\infty} w_H(1-\eta(\theta))g(\theta)\,d\theta}{\rho + \int_{\theta^*}^{\infty}(1-\eta(\theta))g(\theta)\,d\theta} \;+\; r\,\frac{\int_{\theta^*}^{\infty}\theta(1-\eta(\theta))g(\theta)\,d\theta}{\rho + \int_{\theta^*}^{\infty}(1-\eta(\theta))g(\theta)\,d\theta}.\end{aligned} \tag{7}$$

The wealth signaling value of $\psi_\varnothing$ is decreasing in the threshold type θ^*, as a higher threshold implies the observer expects fewer wealthy consumers to purchase the subtle Veblen good. The effects of a change in the threshold level in the second term of Equation 7 is ambiguous for small threshold types, but diminishing in θ^* for sufficiently large threshold types. To simplify comparative statics, we introduce the following assumption, which is maintained throughout the rest of the paper.

Assumption 2. There is a large number of poor consumers, in particular

$$\rho \;\geqslant\; \frac{\int_{\underline{\theta}}^{\infty}(\theta-\underline{\theta})(1-\eta(\theta)g(\theta)\,d\theta}{\underline{\theta}}.$$

With a sufficiently large number of poor unconnected consumers, a higher threshold type makes it less likely that the observed non-consumption signal is originated by well connected wealthy consumers purchasing the subtle Veblen good.

Lemma 1. *Suppose the observer maintains threshold conjectures $\mu(\theta^*)$. Then, the social payoff for the consumer generated by signal $\psi_\varnothing$ is decreasing in the threshold type θ^*, and the social payoff generated by signals ψ_ℓ and ψ_s is increasing in θ^*.*

Proof. See Section 5. ☐

Our argument for the existence of a full equilibrium is in two steps, which also provide some restrictions on prices p_ℓ and p_s. The first such restriction, given in the next lemma, states that the price of the loud Veblen good cannot exceed the highest possible value of the loud signal if conspicuous consumption ought to happen.

Lemma 2. *Suppose the observer forms threshold conjectures. Then there exists a type $\theta^*_\ell \in [\underline{\theta}, \infty)$ such that $u(\ell, \mu(\theta^*_\ell)) \geqslant u(\varnothing, \mu(\theta^*_\ell))$ if and only if the price of the loud Veblen good satisfies*

$$p_\ell \;<\; w_H \;+\; r\,\mathbb{E}\big[\theta\big].$$

When this is the case, one has that $u(\ell, \mu(\theta^*)) > u(\varnothing, \mu(\theta^*))$ for all $\theta^* > \theta^*_\ell$, and $u(\ell, \mu(\theta^*)) < u(\varnothing, \mu(\theta^*))$ for all $\theta^* < \theta^*_\ell$.

Proof. See Section 5. ☐

The difference in expected utility between loud conspicuous consumption and non-consumption is equal to the difference in the social payoffs of the corresponding signals, net of the price of the loud good. When there is a large number of poor unconnected consumers, this difference is increasing in the threshold type θ^* given that the observer uses threshold conjectures. When θ^* becomes very large, the value of the loud signal approaches $w_H + r\,\mathbb{E}[\theta]$ and the value of the non-consumption signal vanishes, as these signals are been generated by the poor consumers. It follows that if the price of the loud good leaves some surplus to wealthy consumers when (almost) all of them are choosing to buy it, then these consumers will indeed choose the loud Veblen good over non-consumption.

It remains to show that there is a threshold type that is indifferent between subtle and loud consumption and in addition weakly prefers either choice to to non-consumption. To do that, define the difference function

$$\Delta_{s,\ell}(\theta) \;\equiv\; u(s,\theta,\mu(\theta)) \;-\; u(\ell,\mu(\theta)). \tag{8}$$

In the next lemma we show that there exists a threshold type θ^* for which $\Delta_{s,\ell}(\theta^*) = 0$. A sufficient condition for this is that the price difference between the subtle and the loud conspicuous goods be larger than the lowest possible expected value gains generated by the subtle consumption choice.

Lemma 3. *Suppose the observer forms threshold conjectures. If the price difference between subtle and loud Veblen goods satisfies the condition*

$$p_s \;-\; p_\ell \;>\; (1 \;-\; \eta(\underline{\theta}))\, r\, \mathbb{E}\big[\theta \mid \psi_\varnothing, \mu(\underline{\theta})\big],$$

then there exists $\theta^* \in (\underline{\theta}, \infty)$ such that $\Delta_{s,\ell}(\theta^*) = 0$.

Proof. See Section 5. □

We stress that the condition on the price difference is *sufficient* for the existence of a threshold type that is indifferent between consuming subtly and loudly. The logic is simple: if the price of the subtle Veblen good is sufficiently large, compared to the price of the loud Veblen good, and the observer expects all wealthy consumers to purchase the subtle option, the social payoff to the less connected buyers associated to its consumption does not compensate for the higher cost they pay. However, as the observer expects more wealthy consumers to purchase the loud conspicuous good, the social payoff of the subtle signal increases its value more than the social payoff of the loud signal, to the point that some wealthy type will be indifferent between buying $\kappa = s$ and paying a higher price, and buying $\kappa = \ell$ and enjoying a discount.

Proposition 2. *A full equilibrium $(\sigma(\theta^*), \mu(\theta^*))$ exists for prices $0 < p_\ell < w_H + r\,\mathbb{E}[\theta]$ and $0 < p_s$.*

Proof. Given Lemmas 2 and 3, it remains to argue the existence of a threshold type $\theta^* \in (\underline{\theta}, \infty)$ that it satisfies conditions $\Delta_{s,\ell}(\theta^*) = 0$ and $\theta^* \geqslant \theta^*_\ell$ simultaneously. Suppose it is not the case, and let θ^* be the largest type such that Equation 8 is equal to zero. Then, increasing the price of the subtle good will turn this into $\Delta_{s,\ell}(\theta^*) < 0$ for the new price of the subtle good. This implies that a new root for Equation 8 will be obtained at some $\theta^{**} > \theta^*$. By letting p_s be sufficiently large, we obtain the desired conclusion. □

3.2 Comparative Statics

In this subsection, we study how changes in the economic environment affect consumption patterns of Veblen goods; in particular, the tradeoff between loud and subtle consumption. One complication in our analysis is that for any given set of parameters values

$\{\rho, w_H, r, g(\cdot), p_\ell, p_s\}$, there may be multiple full equilibria which have different comparative static properties. We will focus on what we call *normal* equilibria.

Definition 2. A full equilibrium $(\sigma(\theta^*), \mu(\theta^*))$ of the consumer–observer signaling game is said to be *normal* if $d\Delta_{s,\ell}(\theta)/d\theta > 0$ at $\theta = \theta^*$.

The conditions on prices imposed to show existence of a full equilibrium also imply that there will be at least one normal equilibrium. Our rationale for focusing on normal equilibria is that they are stable to small perturbations in beliefs, and thus are more likely to survive small amounts of noise in the economic environment. To formalize this point, in Section 5 we construct an intuitive tatonnement process and show that following a small perturbation of the observer's ex-ante beliefs away from equilibrium, the process converges towards the original equilibrium only if it is normal.

Our first comparative statics result is that the extent of subtle consumption is increasing in the value r of signaling connectedness.

Proposition 3. *Suppose that the subtle Veblen good is weakly more costly than the loud Veblen good and let $(\sigma(\theta^*), \mu(\theta^*))$ be a normal equilibrium. Then θ^* is decreasing in r.*

Proof. Explicitly considering the argument r in the difference function of Equation 8, we write $\Delta_{s,\ell}(\theta, r)$ and seek to sign

$$\frac{d\theta^*}{dr} = -\frac{\partial\Delta_{s,\ell}(\theta^*, r)/\partial r}{\partial\Delta_{s,\ell}(\theta^*, r)/\partial\theta^*}.$$

Observe that

$$\begin{aligned}\frac{\partial\Delta_{s,\ell}(\theta^*, r)}{\partial r} &= \eta(\theta^*)\,\mathbb{E}\big[\theta \mid \psi_s, \mu(\theta^*)\big] + (1-\eta(\theta^*)\,\mathbb{E}\big[\theta \mid \psi_\varnothing, \mu(\theta^*)\big] - \mathbb{E}\big[\theta \mid \theta \leqslant \theta^*\big] \\ &= \frac{1}{r}\Big\{\Delta_{s,\ell}(\theta^*, r) + (1-\eta(\theta^*))\big(w_H - \mathbb{E}\big[w \mid \psi_\varnothing, \mu(\theta^*)\big]\big) + p_s - p_\ell\Big\} \\ &> 0.\end{aligned}$$

Since by assumption $(\sigma(\theta^*), \mu(\theta^*))$ is a normal equilibrium, $\partial\Delta_{s,\ell}(\theta^*, r)/\partial\theta^* > 0$. Thus we obtain the desired conclusion. □

Intuitively, an increase in the parameter r increases the value of signaling high social status relative to the value of signaling wealth. The marginal consumer θ^*, who was previously indifferent to either form of Veblen consumption, now finds subtle consumption more valuable. As a result, more consumers choose the subtle Veblen good. We can interpret r as a measure of the amount of social capital in a community: the greater is r, the more valuable social connections are. Proposition 3 thus generates the cross-sectional prediction that, ceteris paribus, communities with more social capital have more subtle consumption and less loud consumption.

Proposition 4. *Suppose that $(\sigma(\theta^*), \mu(\theta^*))$ is a normal equilibrium. Then θ^* is increasing in ρ.*

Proof. As before, we explicitly considere the argument ρ in the difference function $\Delta_{s,\ell}(\theta, \rho)$ and obtain the sign of

$$\frac{d\theta^*}{d\rho} \;=\; -\,\frac{\partial \Delta_{s,\ell}(\theta^*, \rho)/\partial\, \rho}{\partial \Delta_{s,\ell}(\theta^*, \rho)/\partial\, \theta^*}.$$

Now,

$$\begin{aligned}\frac{\partial \Delta_{s,\ell}(\theta^*, \rho)}{\partial \rho} \;&=\; -\,\frac{1-\eta(\theta^*)}{\left(\rho + \int_{\theta^*}^{\infty}(1-\eta(\theta))g(\theta)\,d\theta\right)^2} \\ &\qquad \times \left\{ w_H \int_{\theta^*}^{\infty}(1-\eta(\theta))g(\theta)\,d\theta \;+\; r\int_{\theta^*}^{\infty}\theta(1-\eta(\theta))g(\theta)\,d\theta \right\} \\ &<\; 0.\end{aligned}$$

Since by assumption $(\sigma(\theta^*), \mu(\theta^*))$ is a normal equilibrium, $\partial \Delta_{s,\ell}(\theta^*, \rho)/\partial \theta^* > 0$. The conclusion now follows. □

Consider an increase in ρ, the fraction of poor consumers. If an agent consumes subtly, an undiscerning observer who is outside his social circle observes no Veblen consumption. As ρ becomes larger, the average observer decreases her posterior likelihood that the consumer is wealthy. On the other hand, ρ has no effect on the payoff to loud conspicuous consumption. As a result, subtle consumption becomes relatively less valuable since the no-consumption signal loses value, and fewer wealthy consumers choose this option.

The most common and compelling alternative explanation for the popularity of subtle consumption is that agents are concerned about theft. The point of the theft theory is that it is important not only to signal to the appropriate audience, but to avoid signaling to the inappropriate audience. The theft theory predicts that subtle consumption will be more common in areas with more crime, and conspicuous consumption will dominate in low-crime areas. Casual empiricism suggests just the opposite - in areas of high crime such as poor urban areas, we observe abundance of loud conspicuous consumption, whereas subtle consumption often dominates in areas where crime is low. For this reason, the naive crime argument is not very compelling. On the other hand, this observation is perfectly consistent with our model. There is evidence that crime rates tend to be negatively correlated with social capital.[4] In our model, an increase in the amount of social capital results, ceteris paribus, in a decrease in the amount of conspicuous consumption. This generates a positive correlation between conspicuous consumption and crime rates. Insofar as this correlation exists, it suggests that the choice to consume subtly is driven more by the desire to signal social status than any attempt to avoid theft.

4 Equilibrium with Endogenous Prices

So, far our analysis has been of settings where prices are exogenous. In this section, we endogenize prices by assuming that prices for both the loud and subtle goods are set by a profit maximizing monopolist. To keep matters simple, we assume that the monopolist

[4] See, for example, Sampson and Groves (1989).

produces both the loud and subtle good at zero marginal cost. Beyond choosing prices p_s, p_ℓ, the monopolist can also resolve equilibrium multiplicity in his favor: specifically, given the exogenous parameters $\{\rho, w_H, r, g(\cdot)\}$, the monopolist can select any triplet $\{p_\ell, p_s, \theta^*\}$ for which $(\sigma(\theta^*), \mu(\theta^*))$ constitutes a PBE of the consumer–observer signaling game.

Because our main interest is finding out the pattern of relative prices in a full equilibria with endogenous prices, where some wealthy consumers buy the loud Veblen good and some buy the subtle good, we introduce the following modification to our model. The reason for this modification will become apparent later on. Let $v\colon \Theta \to \mathbb{R}$ be an increasing concave function, so that its inverse v^{-1} is increasing and convex. The consumer's payoff derived from social evaluation given signal ψ and conjecture μ is now defined by

$$\hat{\pi}(\psi, \mu) \;=\; \mathbb{E}\big[w \mid \psi, \mu\big] \;+\; r\, v^{-1}\big(\mathbb{E}\big[v(\theta) \mid \psi, \mu\big]\big). \tag{9}$$

From Proposition 1 and Assumption 1 (immediately adapted to our new specification of the social payoffs) we shall restrict attention to two kinds of equilibria. Given any $\theta^* \in [\underline{\theta}, \infty]$, an *incomplete equilibrium* $(\sigma^I(\theta^*), \mu^I(\theta^*), p_\ell^I, p_s^I)$ is such that all types $\theta < \theta^*$ choose non-consumption and all types $\theta > \theta^*$ choose subtle consumption at prices p_ℓ^I, p_s^I. A *complete equilibrium* $(\sigma^C(\theta^*), \mu^C(\theta^*), p_\ell^C, p_s^C)$ on the other hand is such that all types $\theta < \theta^*$ choose to buy the loud Veblen good at price p_ℓ^C, and all types $\theta > \theta^*$ choose to consume the subtle good at price p_s^C. Notice a full equilibrium is a complete equilibrium for a threshold type $\theta^* \in (\underline{\theta}, \infty)$. The monopolist's profit function in an incomplete equilibrium is

$$TR^I \;=\; p_s^I(1 \,-\, G(\theta^*)),$$

and the profit function in a complete equilibrium is

$$TR^C \;=\; p_\ell^C G(\theta^*) \;+\; p_s^C(1 \,-\, G(\theta^*)).$$

In an incomplete equilibrium, the marginal wealthy consumer θ^* is indifferent between purchasing the subtle good and not entering the market: $\hat{u}(s, \theta^*, \mu^I(\theta^*)) = \hat{u}(\varnothing, \mu^I(\theta^*))$. This determines p_s^I as an increasing function of θ^* (and implicitly the threshold conjecture μ^I) via the expression

$$p_s^I(\theta^*) \;=\; \eta(\theta^*)\big[\hat{\pi}(\psi_s, \mu^I(\theta^*)) \,-\, \hat{\pi}(\psi_\varnothing, \mu^I(\theta^*))\big]. \tag{10}$$

In a complete equilibrium, the monopolist sets prices $p_\ell^C(\theta^*)$ and $p_s^C(\theta^*)$ such that the threshold type θ^* is indifferent between purchasing the subtle good and purchasing the loud Veblen good, *and* in addition he is indifferent between consuming $\kappa = \ell$ and non-consumption, given correct threshold conjecture $\mu^C(\theta^*)$ by the observer. If the threshold wealthy consumer instead strictly prefers loud consumption to the non-consumption option, then the monopolist can increase the price of both conspicuous goods in a way that maintains their difference constant and makes the threshold consumer indifferent between purchasing the loud Veblen good and staying out of the market. This pins down both prices via the following expressions

$$p_\ell^C(\theta^*) \;=\; \hat\pi(\psi_\ell, \mu^C(\theta^*)) \;-\; \hat\pi(\psi_\varnothing, \mu^C(\theta^*)), \qquad \text{and} \tag{11}$$
$$p_s^C(\theta^*) \;=\; \eta(\theta^*)\big[\hat\pi(\psi_s, \mu^C(\theta^*)) \;-\; \hat\pi(\psi_\varnothing, \mu^C(\theta^*))\big]. \tag{12}$$

We alter our Assumption 2 accordingly, and point out that with this assumption all of our previous results continue to hold.

Assumption 3. There is a large number of poor consumers, in particular

$$\rho \;\geq\; \frac{\int_{\underline{\theta}}^{\infty}(v(\theta)-v(\underline{\theta}))(1-\eta(\theta)g(\theta)\,d\theta}{v(\underline{\theta})}.$$

The role of this assumption is similar as the role of its predecessor. It allows us to conclude that the social payoff of the non-consumption signal is decreasing in the social connectedness parameter when the observer forms threshold conjectures $\mu^C(\theta^*)$. However, the social payoff of the non-consumption signal is increasing in θ^* when the observer uses threshold conjectures $\mu^I(\theta^*)$ associated with an incomplete equilibrium. As it turns out, the social payoff of the subtle signal remains the same under either equilibrium.

Lemma 4. *One has that $\hat\pi(\psi_\varnothing, \mu^C(\theta^*))$ is decreasing in the threshold type θ^* if the observer maintains threshold conjectures $\mu^C(\theta^*)$, but $\hat\pi(\psi_\varnothing, \mu^I(\theta^*))$ is increasing in the threshold type θ^* if the observer maintains threshold conjectures $\mu^I(\theta^*)$. Both $\hat\pi(\psi_\ell, \mu^C(\theta^*))$ and $\hat\pi(\psi_s, \mu^C(\theta^*)) = \hat\pi(\psi_s, \mu^I(\theta^*))$ are increasing in θ^*.*

Proof. The proof uses arguments similar to the proof of Lemma 1. We omit details. □

Our existence result is the following.

Proposition 5. *Suppose $v\colon \Theta \to \mathbb{R}$ is increasing and concave. Then a profit-maximizing equilibrium exists.*

Proof. We start by focusing on complete equilibria. Using Eq. (11) and Eq. (12), the expression for total revenue in a complete equilibrium is written as

$$\begin{aligned} TR^C(\theta^*) \;&=\; G(\theta^*)\big\{\hat\pi(\psi_\ell, \mu^C(\theta^*)) \;-\; \hat\pi(\psi_\varnothing, \mu^C(\theta^*))\big\} \\ &\quad+\; (1-G(\theta^*))\eta(\theta^*)\big\{\hat\pi(\psi_s, \mu^C(\theta^*)) \;-\; \hat\pi(\psi_\varnothing, \mu^C(\theta^*))\big\}, \end{aligned}$$

with the understanding that now the social payoff of signal ψ_κ is as in Equation 9, for $\kappa \in \{\varnothing, \ell, s\}$. We seek to show that $\sup\{TR^C(\theta^*) \mid \theta^* \in [\underline{\theta}, \infty]\}$ is attained. Since the total revenue function is continuous, it suffices to show that $\lim_{\theta^*\to\infty} TR^C(\theta^*) < \infty$. To that end, we express total revenues as follows:

$$\begin{aligned}
TR^C(\theta^*) \;&=\; G(\theta^*)\, r\, v^{-1}\left(\frac{\int_{\underline{\theta}}^{\theta^*} v(\theta)g(\theta)\,d\theta}{\int_{\underline{\theta}}^{\theta^*} g(\theta)\,d\theta}\right) \;+\; (1-G(\theta^*))\eta(\theta^*)\, r\, v^{-1}\left(\frac{\int_{\theta^*}^{\infty} v(\theta)\eta(\theta)g(\theta)\,d\theta}{\int_{\theta^*}^{\infty}\eta(\theta)g(\theta)\,d\theta}\right)\\
&\quad+\;\big(G(\theta^*)\,+\,(1-G(\theta^*))\eta(\theta^*)\big)\big[w_H\,-\,\hat{\pi}\big(\psi_\varnothing,\mu^C(\theta^*)\big)\big]\\
&\leqslant\; G(\theta^*)\, r\,\frac{\int_{\underline{\theta}}^{\theta^*}\theta g(\theta)\,d\theta}{\int_{\underline{\theta}}^{\theta^*} g(\theta)\,d\theta}\;+\;(1-G(\theta^*))\eta(\theta^*)\, r\,\frac{\int_{\theta^*}^{\infty}\theta\eta(\theta)g(\theta)\,d\theta}{\int_{\theta^*}^{\infty}\eta(\theta)g(\theta)\,d\theta}\\
&\quad+\;\big(G(\theta^*)\,+\,(1-G(\theta^*))\eta(\theta^*)\big)\big[w_H\,-\,\hat{\pi}\big(\psi_\varnothing,\mu^C(\theta^*)\big)\big].
\end{aligned}$$

Now notice that for all $\theta^* < \infty$, one has $\eta(\theta^*)(1-G(\theta^*)) = \int_{\theta^*}^{\infty}\eta(\theta^*)g(\theta)d\theta \leqslant \int_{\theta^*}^{\infty}\eta(\theta)g(\theta)d\theta$, thus we deduce from the above expression that for all $\theta^* \in \Theta$,

$$\begin{aligned}
TR^C(\theta^*) \;\leqslant\; r\int_{\underline{\theta}}^{\theta^*}\theta g(\theta)\,d\theta \;+\; r\int_{\theta^*}^{\infty}\theta\eta(\theta)g(\theta)\,d\theta\\
+\;\big(G(\theta^*)\,+\,(1-G(\theta^*))\eta(\theta^*)\big)\big[w_H\,-\,\hat{\pi}\big(\psi_\varnothing,\mu^C(\theta^*)\big)\big].
\end{aligned}$$

The expression in the right-hand side of the above equation is strictly increasing in θ^* and converges to $w_H + r\mathbb{E}[\theta]$. It follows that $\lim_{\theta^*\to\infty} TR^C(\theta^*) < \infty$, as desired.

It remains to show that analogous result holds for incomplete equilibria. Given threshold $\theta^* < \infty$ and Equation 10, we can write total revenues as

$$TR^I(\theta^*) \;=\; \big(1\,-\,G(\theta^*)\big)\,\eta(\theta^*)\big[\hat{\pi}(\psi_s,\mu^I(\theta^*))\,-\,\hat{\pi}(\psi_\varnothing,\mu^I(\theta^*))\big].$$

As before, it suffices to show that $\lim_{\theta^*\to\infty} TR^I(\theta^*) < \infty$. As we mentioned, $\hat{\pi}(\psi_s,\mu^I(\theta^*)) = \hat{\pi}(\psi_s,\mu^C(\theta^*))$ for all threshold levels, thus we have

$$TR^I(\theta^*) \;\leqslant\; r\int_{\theta^*}^{\infty}\theta\eta(\theta)g(\theta)\,d\theta \;-\; (1-G(\theta^*))\hat{\pi}(\psi_\varnothing,\mu^I(\theta^*)).$$

The first term of the above expression vanishes as θ^* tends to infinity. Moreover, $\hat{\pi}(\psi_\varnothing,\mu^I(\theta^*))$ is increasing in θ^* and converges to $w_H/(\rho+1) + rv^{-1}(\mathbb{E}[v(\theta)]/(\rho+1))$. It follows that $\lim_{\theta^*\to\infty} TR^I(\theta^*) < \infty$. This completes the proof. □

Proposition 5 does not provide existence of a full equilibrium. In particular, when v is a linear function (as for instance, when we let v be the identity function and go back to our original model), one can show that the profit maximizing equilibrium is a complete equilibrium with $\theta^* = \infty$, so that all wealthy consumers purchase the loud Veblen good. However, it is easy to check that the profit-maximizing equilibrium is full for a nonempty range of parameter values. For example, with $r = 1, w_H = 1, \eta(\theta) \equiv \frac{\theta}{1-\theta}, \underline{\theta} = 1, g(\theta) \equiv e^{-(\theta-\underline{\theta})}$, and $v(x) \equiv \sqrt{x}$, the profit-maximizing equilibrium is full for all $\rho > 0$.

The main result of this section is that a monopolist optimally sets a strictly higher price for the subtle good than for the loud good.

Proposition 6. *If the profit-maximizing equilibrium is full, then it must be that $p_s > p_\ell$.*

Proof. To obtain a contradiction, assume that there exists a profit-maximizing full equilibrium where $p_s \leqslant p_\ell$. Let θ^* be the corresponding threshold type. Since a full equilibrium is a complete interior equilibrium, p_ℓ and p_s are specified as functions of the threshold type by Equation 11 and Equation 12. Moreover, using Lemma 4 one sees that these are indeed increasing functions. Now, total profits equal

$$TR(\theta^*) \;=\; p_\ell(\theta^*)\,G(\theta^*) \;+\; p_s(\theta^*)\,(1-G(\theta^*)),$$

so differentiating with respect to θ^* obtains

$$\begin{aligned}\frac{dTR(\theta^*)}{d\theta^*} \;&=\; p'_\ell(\theta^*)G(\theta^*) \;+\; p_\ell(\theta^*)g(\theta^*) \;+\; p'_s(\theta^*)(1-G(\theta^*)) \;-\; p_s(\theta^*)g(\theta^*)\\ &=\; p'_\ell(\theta^*)G(\theta^*) \;+\; p'_s(\theta^*)(1-G(\theta^*)) \;+\; (p_\ell(\theta^*)-p_s(\theta^*))g(\theta^*) \;>\; 0.\end{aligned}$$

That is, a small increase in threshold from θ^* results in an increase in profits, which contradicts the premise that θ^* is the threshold level associated to the profit-maximizing equilibrium. □

4.1 Endogenous Prices: Evidence

One of the coauthors and a research assistant traveled to the Copley Mall in Boston, Massachusetts in order to examine status goods and compare prices. We looked for pairs of goods which were identical except for the pattern printed on the fabric. We consider a pattern covered in brand logos to be more overt in the sense that a larger number of observers will identify the item as expensive. In many cases, identical shoe and bag designs featured different patterns and different fabrics, and, in every such case, the logo-free shoes and bags were made of a more expensive fabric (in one case, we asked the clerk at the Gucci store why the logo-free shoes were $720, while the logo-printed shoes were only $405, and the answer was that the logo-free shoes were made of ostrich).

Brand	*Style*	*Logo Price*	*No Logo Price*
Louis Vuitton	Slingback	\$600	\$640
	Sandal	\$335	\$445
	Driving Loafer	\$575	\$585
Gucci	Duffel Bag	\$750	\$1750
	Bag	\$1200	\$1100
	Shoe	\$485	\$495
	Shoe	\$495	\$535
	Shoe	\$405	\$740
	Slide	\$405	\$420
	Ballet Slipper	\$410	\$420
	Men's Loafer	\$375	\$340
	Men's Belt	\$285	\$260
Fendi	Bag	\$1800	\$2120
	Bag	\$900	\$1220
Ferragamo	Moccasin	\$310	\$340
Coach	Bag	\$398	\$458
	Bag	\$178	\$198
	Bag	\$648	\$698
	Tennis Shoe	\$88	\$98

5 Conclusion

We explain the consumption of subtle Veblen goods as an attempt to signal social capital in addition to wealth. The defining characteristic of subtle consumption is that it is relatively easy to recognize in the context of social interaction. We argue that this theory explains important facts about consumption patterns – in particular, why "old money" types focus on subtle consumption such as cultural knowledge, whereas "nouveau riche" types focus on loud consumption.

Our theory has a number of interesting implications. First, it suggests that existing economic theories of conspicuous consumption is missing key aspects of status signaling by focusing solely on wealth; in particular, it is neglecting social and cultural capital, both of which have been emphasized by the sociological literature on status. Second, it suggests that empirical work on conspicuous consumption has to take into account the possibility that much conspicuous consumption takes subtle, non-tangible forms such as cultural capital.

Appendix A: Stability of Normal Equilibria

In this section, we formalize the claim made in Section 3.2 that normal equilibria are generically stable to small perturbations. Start by restricting attention to full equilibria whereby (i) consumers strictly prefer loud consumption over non-consumption, thus $u(\ell, \mu(\sigma^*)) > u(\varnothing, \mu(\sigma^*))$, (ii) $\left.\frac{d\gamma(\theta,\theta)}{d\theta}\right|_{\theta=\theta^*} \neq 0$, and (iii) $\left.\frac{d\gamma(\theta',\theta)}{d\theta}\right|_{\theta'=\theta=\theta^*} \neq 0$; these two conditions hold generically for normal equilibria if $\eta(\cdot)$ and $F(\cdot)$ are analytic.

Consider the following tatonnement process to model the joint evolution of the consumer's strategy σ and the observer's conjecture μ_t in continuous time. We'll restrict attention to threshold strategies; at each instant t, we denote the threshold corresponding to the consumer's strategy by θ_t and the threshold corresponding to the observer's conjecture by $\tilde{\theta}_t$.[5]

- The observer adjusts her conjecture gradually to changes in the consumer's beliefs: at each instant t, $d\tilde{\theta}_t = \text{sgn}\left(\theta_t - \tilde{\theta}_t\right) dt$.
- The consumer responds instantaneously to changes in the observer's conjecture, so that at each instant t, the consumer's strategy is the best-response to the observer's conjecture: $\gamma(\theta_t, \tilde{\theta}_t) = 0$.[6]

Now, at time $t = 0$, introduce a small shock to the observer's conjecture, away from the equilibrium θ^*: i.e., $\tilde{\theta}_0 = \theta^* + \tilde{\varepsilon}$. The following result states that beliefs and conjectures revert to the equilibrium threshold following such a shock only if the equilibrium is normal:

Proposition 7. *Consider an equilibrium with* $\left.\frac{d\gamma(\theta,\theta)}{d\theta}\right|_{\theta=\theta^*} \neq 0$. *There exists* $\bar{\varepsilon} > 0$ *such that* $\lim_{t\to\infty}(\theta_t, \tilde{\theta}_t) = (\theta^*, \theta^*)$ *for all* $\varepsilon < \bar{\varepsilon}$ *if and only if the equilibrium is normal.*

Proof. WLOG, assume $\varepsilon > 0$, so initially (i.e. for small t) $\varepsilon_t > 0$. First, write $\theta_t = \theta^* + \varepsilon_t$ and $\tilde{\theta}_t = \theta^* + \tilde{\varepsilon}_t$; note that $d\tilde{\varepsilon}_t = \text{sgn}(\varepsilon_t - \tilde{\varepsilon}_t)$. Then since $\gamma(\theta^*, \theta^*) = \gamma\left(\theta_t, \tilde{\theta}_t\right) = 0$, we have

$$\gamma_1(\theta^*, \theta^*)\,\varepsilon_t + \gamma_2(\theta^*, \theta^*)\,\tilde{\varepsilon}_t \approx 0, \text{ i.e.,}$$
$$\frac{\varepsilon_t}{\tilde{\varepsilon}_t} \approx -\frac{\gamma_2(\theta^*, \theta^*)}{\gamma_1(\theta^*, \theta^*)}.$$

Note that $\gamma_1(\theta^*, \theta^*) > 0$. Consider a normal equilibrium with $\left.\frac{d\gamma(\theta,\theta)}{d\theta}\right|_{\theta=\theta^*} > 0$, so that $\gamma_1(\theta^*, \theta^*) + \gamma_2(\theta^*, \theta^*) > 0$. In the case $\gamma_2(\theta^*, \theta^*) > 0$, we infer that for small shocks ε_t and $\tilde{\varepsilon}_t$ must have opposite sign, so $d\tilde{\varepsilon}_t = \text{sgn}(\varepsilon_t - \tilde{\varepsilon}_t) = -\text{sgn}(\tilde{\varepsilon}_t)$. If $\gamma_2(\theta^*, \theta^*) < 0$, we infer that $\tilde{\varepsilon}_t$ must have the same sign as, and greater magnitude than, ε_t; so again $d\tilde{\varepsilon}_t = \text{sgn}(\varepsilon_t - \tilde{\varepsilon}_t) = -\text{sgn}(\tilde{\varepsilon}_t)$. This means that $\tilde{\varepsilon}_t$ (and thus ε_t) decrease to zero over time, as the proposition claims.

Next, consider a non-normal equilibrium with $\frac{d\gamma(\theta,\theta)}{d\theta} < 0$, so that $\gamma_1(\theta^*, \theta^*) + \gamma_2(\theta^*, \theta^*) < 0$. Then for small shocks $\tilde{\varepsilon}_t$ must have the same sign as, and smaller magnitude than, ε_t; so $d\tilde{\varepsilon}_t = \text{sgn}(\varepsilon_t - \tilde{\varepsilon}_t) = \text{sgn}(\tilde{\varepsilon}_t)$. It follows that This means that $|\tilde{\varepsilon}_t|$ is increasing in t for $\tilde{\varepsilon}_t$ in some neighbourhood of zero, so $\lim_{t\to\infty} \tilde{\theta}_t \neq \theta^*$. This establishes the proposition.

The result follows. □

Appendix B: Omitted Proofs

Proof of Lemma 1. Given the threshold conjecture $\mu(\theta^*)$ from the observer, it is clear that the derivative of the first term of the right-hand side of Equation 7 with respect to

[5] This assumption is without loss of generality for small deviations from equilibrium.

[6] Our conclusions do not change if the consumer's adjustment is gradual rather than instantaneous.

θ^* is negative. Similarly, for the second term of $\pi(\psi_\varnothing, \mu(\theta^*))$ we obtain

$$\begin{aligned} &\frac{d}{d\theta^*}\left\{\frac{\int_{\theta^*}^{\infty}\theta(1-\eta(\theta))g(\theta)\,d\theta}{\rho + \int_{\theta^*}^{\infty}(1-\eta(\theta))g(\theta)\,d\theta}\right\} \\ &\qquad = -\frac{(1-\eta(\theta^*))g(\theta^*)\Big[\rho\theta^* - \int_{\theta^*}^{\infty}(\theta-\theta^*)(1-\eta(\theta))g(\theta)\,d\theta\Big]}{\big(\rho + \int_{\theta^*}^{\infty}(1-\eta(\theta))g(\theta)\,d\theta\big)^2}. \end{aligned} \tag{13}$$

From Equation 13, it suffices to show that for all $\theta^* > \underline{\theta}$,

$$\phi(\theta^*) \;\equiv\; \rho\theta^* \;-\; \int_{\theta^*}^{\infty}(\theta-\theta^*)(1-\eta(\theta))g(\theta)\,d\theta \;>\; 0.$$

Observe that for all such θ^*,

$$\phi'(\theta^*) \;=\; \rho + \int_{\theta^*}^{\infty}(1-\eta(\theta))g(\theta)\,d\theta \;>\; 0.$$

Noticing that $\phi(\underline{\theta}) \geqslant 0$ follows from Assumption 2, we obtain the desired conclusion. The fact that $\pi(\psi_\ell, \mu(\theta^*))$ and $\pi(\psi_s, \mu(\theta^*))$ are both increasing in θ^* follows directly from differentiating Eq. (5) and Eq. (6) with respect to θ^*. We omit details. □

Proof of Lemma 2. The difference between the utility of loud consumption and the utility of non-consumption is given by

$$\Delta_{\ell,\varnothing}(\theta^*) \;\equiv\; u(\ell, \mu(\theta^*)) \;-\; u(\varnothing, \mu(\theta^*)) \;=\; \pi(\psi_\ell, \mu(\theta^*)) \;-\; \pi(\psi_\varnothing, \mu(\theta^*)) \;-\; p_\ell.$$

From Lemma 1, $\Delta_{\ell,\varnothing}$ is strictly increasing in the threshold type. Thus, to obtain existence of $\theta_\ell^* \in [\underline{\theta}, \infty)$ for which $\Delta_{\ell,\varnothing}(\theta_\ell^*) \geqslant 0$, it is sufficient as well as necessary that

$$\lim_{\theta^*\to\infty} \Delta_{\ell,\varnothing}(\theta^*) \;=\; w_H \;+\; r\,\mathbb{E}\big[\theta\big] \;-\; p_\ell \;>\; 0,$$

which is precisely what the restriction on p_ℓ requires. Moreover, using Lemma 1 it is clear that for all threshold types above θ_ℓ^* the expression becomes strictly positive, and for all types below θ_ℓ^* the difference becomes negative. □

Proof of Lemma 3. For $\theta^* \in \Theta$, we re-write the difference function in Equation 8 as follows:

$$\begin{aligned} \Delta_{s,\ell}(\theta^*) \;=\; &\eta(\theta^*)\big\{w_H \;+\; r\,\mathbb{E}\big[\theta \mid \psi_s, \mu(\theta^*)\big]\big\} \\ &+\; (1-\eta(\theta^*))\big\{\mathbb{E}\big[w \mid \psi_\varnothing, \mu(\theta^*)\big] \;+\; r\,\mathbb{E}\big[\theta \mid \psi_\varnothing, \mu(\theta^*)\big]\big\} \\ &-\; w_H \;-\; r\,\mathbb{E}\big[\theta \mid \theta \leqslant \theta^*\big] \;-\; \{p_s \;-\; p_\ell\}. \end{aligned}$$

Evaluated at $\underline{\theta}$, this difference becomes

$$\begin{aligned}
\Delta_{s,\ell}(\underline{\theta}) \;&=\; \eta(\underline{\theta})\big\{w_H \,+\, r\,\mathbb{E}\big[\theta \mid \psi_s, \mu(\underline{\theta})\big]\big\} \,+\, (1-\eta(\underline{\theta}))\big\{\mathbb{E}\big[w \mid \psi_\varnothing, \mu(\underline{\theta})\big] \,+\, r\,\mathbb{E}\big[\theta \mid \psi_\varnothing, \mu(\underline{\theta})\big]\big\} \\
&\quad -\, w_H \,-\, r\,\underline{\theta} \,-\, \{p_s \,-\, p_\ell\} \\
&\leqslant\; \eta(\underline{\theta})\, r\,\mathbb{E}\big[\theta \mid \psi_s, \mu(\underline{\theta})\big] \;+\; (1-\eta(\underline{\theta}))\, r\,\mathbb{E}\big[\theta \mid \psi_\varnothing, \mu(\underline{\theta})\big] \,-\, r\,\underline{\theta} \,-\, \{p_s \,-\, p_\ell\}.
\end{aligned}$$

Notice that $\mathbb{E}[\theta\eta(\theta)] \geq \underline{\theta}$. Now, from the assumption made on the price difference, we have

$$\begin{aligned}
p_s \,-\, p_\ell \;&>\; r\,(1-\eta(\underline{\theta}))\,\mathbb{E}\big[\theta \mid \psi_\varnothing, \mu(\underline{\theta})\big] \;+\; r\,\mathbb{E}\big[\theta\eta(\theta)\big] \,-\, r\,\underline{\theta} \\
&=\; r\,(1-\eta(\underline{\theta}))\,\mathbb{E}\big[\theta \mid \psi_\varnothing, \mu(\underline{\theta})\big] \;+\; r\,\frac{\eta(\underline{\theta})\int_{\underline{\theta}}^{\infty}\theta\eta(\theta)g(\theta)\,d\theta}{\int_{\underline{\theta}}^{\infty}\eta(\underline{\theta})g(\theta)\,d\theta} \,-\, r\,\underline{\theta} \\
&\geqslant\; r\,(1-\eta(\underline{\theta}))\,\mathbb{E}\big[\theta \mid \psi_\varnothing, \mu(\underline{\theta})\big] \;+\; r\,\frac{\eta(\underline{\theta})\int_{\underline{\theta}}^{\infty}\theta\eta(\theta)g(\theta)\,d\theta}{\int_{\underline{\theta}}^{\infty}\eta(\theta)g(\theta)\,d\theta} \,-\, r\,\underline{\theta} \\
&=\; r\,(1-\eta(\underline{\theta}))\,\mathbb{E}\big[\theta \mid \psi_\varnothing, \mu(\underline{\theta})\big] \;+\; r\,\eta(\underline{\theta})\,\mathbb{E}\big[\theta \mid \psi_s, \mu(\underline{\theta})\big] \,-\, r\,\underline{\theta}.
\end{aligned}$$

Combining these two observations obtains $\Delta_{s,\ell}(\underline{\theta}) < 0$. On the other hand, as $\theta' \to \infty$, $\Delta(\theta') \to \infty$. Using a standard continuity argument, there must be a type $\theta^* \in (\underline{\theta}, \infty)$ such that $\Delta_{s,\ell}(\theta^*) = 0$, as desired. □

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