Conflicting Measures of Poverty and Inadequate Saving by the Poor – The Role of Status Driven Utility Function

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ABSTRACT

In presence of inequality a status driven utility function reconciles the conflict between income based and nutrition based measures of poverty. Moreover, it can explain why the poor tend to save less, an established empirical fact in the developing countries. The result is independent of the assumption of imperfect capital market. The paper attempts to integrate various strands of literature on status effects.

Keywords: Inequality, Inter-temporal consumer choice, Utility, Poverty,

JEL Codes: D63, D91, D11, I3

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Section I

Introduction

A fundamental query involving the preference pattern of any individual in a society has to deal with the social influence on individual consumption behavior. The idea of conspicuous consumption and the so-called Veblen effect are quite well known in economics. Very recently Sivanathan and Pettit (2010) have confirmed the fact that individuals are quite sensitive to their relative status in the society and would like to "mend" their "self", under constant attack from various social pressures by taking recourse to status signaling consumption behavior. A series of experiments confirm such a pattern of human behavior. This is one of the building blocks of the utility function that we use and the subsequent analysis.

The paper starts off by highlighting a well observed empirical phenomenon discussed extensively in the literature on poverty in India. In this context Patnaik (2007) and Deaton and Dreze (2009) have discussed about the conflict between income-based measure and nutrition-based measure of poverty. In India people moving above the poverty line with greater monthly expenditure on overall consumption demonstrates lower nutritional intake. Thus Patnaik (2007) asserts that actual poverty estimate is far greater than the optimistic figure provided by the Government. While Deaton and Dreze (2009) analyze various reasons for such a behavior, not much emphasize is given to the role of status driven consumption pattern, although they do not ignore such a possibility. That social inequality can influence individual's consumption and induce greater consumption of the so called status good, becomes quite relevant for such analysis. Thematically this is undermined and underexplored in the poverty literature. We shall demonstrate how preexisting social inequality can lead to the conflicting measures of poverty.

Banerjee and Duflo (2007) reporting on various country studies have emphasized the fact that in general the poor do not save what they should. In other words the bias towards current consumption is a remarkably consistent empirical fact valid for a large cross-section of the developing countries. Fafchamps ans Shilpi (2008) have demonstrated how the presence of richer persons in a community affects the

perceptions of well being of the individuals. Such perception coupled with the status driven consumption behavior can lead to a bias towards current consumption. The dynamic extension on the basic framework yields this result without being dependent on further assumptions.

In an interesting paper Moav and Neeman (2010) derives the inadequate saving result in terms of a framework with bequests, as initially modeled in Galor and Zeira (1993). They also use the notion of social status as a basic driving factor which via conspicuous consumption affects current bequests and hence may perpetuate poverty trap. Essential ingredient of this type of analysis is the existence of an imperfect credit market which does not allow everyone to borrow and lend at a given rate of interest. In our framework we abstract from all such complexities and use the evolution of social distribution of income as a driving force.

One must mention that there is a literature on status and growth pioneered by Cole et al (1992) and later extended by Corneo and Jeanne (1998). The message of this literature is that the aspiration effect i.e. the effort to attain higher status induces agent to over-accumulate relative to the standard case i.e. without such concern for status. In a general context, therefore, two offsetting effects must be considered, one that pushes the individual to consume more and the other when saving intensity is higher. We shall reflect on this issue in course of our analysis. Interestingly to highlight our concern we have a way to block the "over-accumulation the capital effect" due to concern for status.

A voluminous literature discusses the impact of social status, relative income and relative rewards on productivity such as Hopkins and Kornienko (2010), Ku and Salmon (2010), on optimal taxation such as Beath and Fitzroy(2010), Kanbur and Toumala(2010) and on network such as Ghiglino and Goyal (2008). However, these papers do not deal with the issues we are discussing in this paper.

The paper proceeds as follows. In the next section we discuss the issue of possible conflict between income and nutrition based measures of poverty. In the third section

we analyze the saving problem in a simple two-period framework. The last section concludes the paper.

Section II

Basic Framework

We start from two possible axioms as to how perceived social inequality affects the individual welfare.

Axiom 1: Inequality hurts.

This implies that having below average income in a society reduces individual utility. Our assumption will be that being above average does not matter, but being below definitely hurts. This asymmetry is deliberate to highlight the implications of belonging in the downside of inequality.

Axiom 2: Inequality increases MU for status good.

Having lower than average income increases the marginal utility of conspicuous consumption or consumption of the status good. This is directly drawn from experimental psychology literature where intensity of desire to consume the status good seems to be greater among those who are psychology affected by social inequality.

We now invoke a simple log linear utility function with N, the consumption of Nutrition good and L, the consumption of luxury or status good or non-nutrition good.

$$U = f\left(\frac{\bar{y}}{y}\right)\left[\log N + \phi\left(\frac{\bar{y}}{y}\right)\log L\right] \qquad (1)$$

$\bar{y}$ is average income of the reference social group. y is individual income levels.

$$f\left(\frac{\bar{y}}{y}\right)\begin{bmatrix} = 1\ for\ y \geq \bar{y} \\ < 1\ for\ y < \bar{y} \end{bmatrix} \qquad (2)$$

and $f' < 0$. [Follows from Axiom 1]

$$\phi\left(\frac{\bar{y}}{y}\right)\begin{bmatrix}=1\ for\ y \geq \bar{y}\\ >1\ for\ y < \bar{y}\end{bmatrix} \quad (3)$$

and $\phi' > 0$. [Follows from Axiom 2]

We shall not discuss price effect and assume prices to be equal to one.

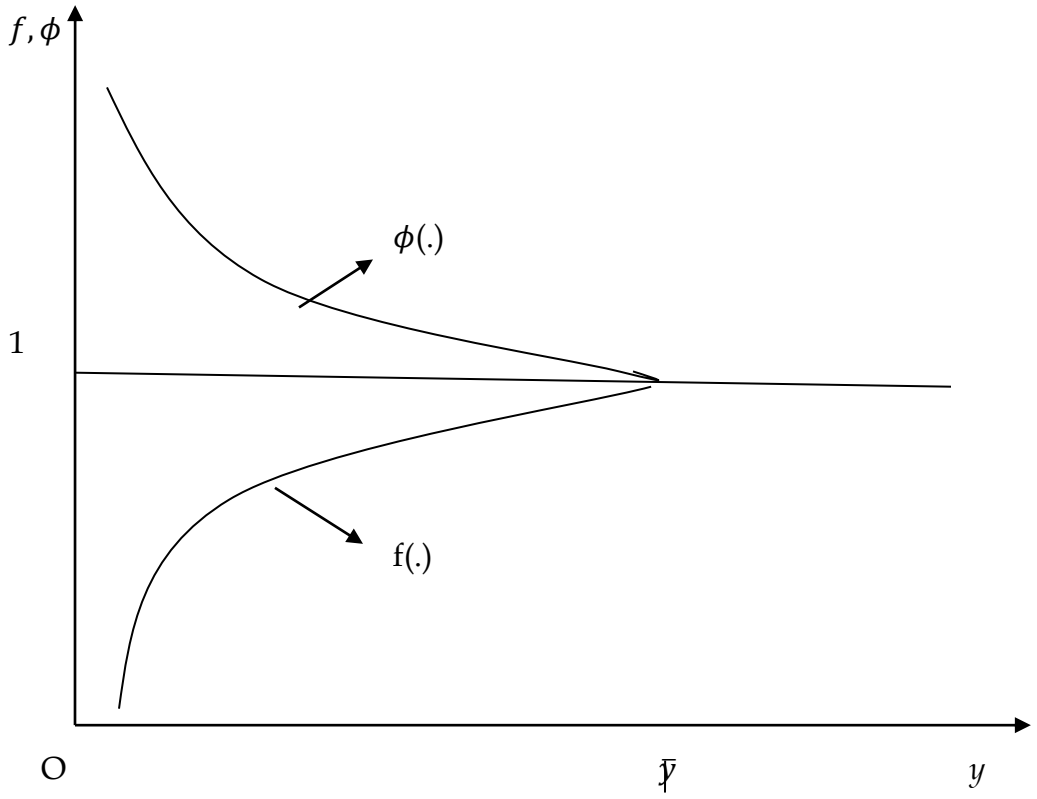

Fig-1

If inequality truly hurts,

$$f\left(\frac{\bar{y}}{y}\right)\left[\log\tilde{N}+\phi\left(\frac{\bar{y}}{y}\right)\log\tilde{L}\right] < \left[\log N_0+\phi\left(\frac{\bar{y}}{y}\right)\log L_0\right] \quad (4)$$

Where $(\tilde{\mathrm{N}}, \tilde{\mathrm{L}})$ are optimal consumption levels for $y < \bar{y}$ and $(\mathrm{N}_0, \mathrm{L}_0)$ are the same for the benchmark case with $y = \bar{y}$ i.e. the social average income rises without a decline in individual income.

Invoking the Envelope property it is straightforward to interpret (U) as

$$\frac{dU}{dy} = f'\left(-\frac{\bar{y}}{y^2}\right)\left(\log\tilde{\mathrm{N}} + \phi\left(\frac{\bar{y}}{y}\right)\log\tilde{\mathrm{L}}\right) + f.\phi'\left(-\frac{\bar{y}}{y^2}\right)\log\tilde{\mathrm{L}} > 0$$

Or, $-\left(\frac{\bar{y}}{y^2}\right)f'\ \log\tilde{\mathrm{N}} - \left(\frac{\bar{y}}{y^2}\right)\log\tilde{\mathrm{L}}\,[f'\phi + f\phi'] > 0$

Since $f' < 0$ and $\phi' > 0$, a sufficient condition is given by

$$[f'\phi + f\phi'] < 0 \qquad (5)$$

Note that if y moves up the ladder f(.) increases but ϕ drops. Or put differently if y drops from $\bar{y}$, f goes down to a value less than 1, but ϕ increases, the net effect has to be negative if inequality has to hurt in equilibrium. We shall return to condition (5) later.

It is obvious that in equilibrium

$$\tilde{\mathrm{N}} = \frac{\mathrm{y}}{1+\phi} \qquad (6)$$

We are interested in the level of consumption of N as y increases from below $\bar{y}$. Given $\left(\frac{\bar{y}}{y}\right)$; (6) is a very standard outcome. When $\phi = 1$, by virtue of having this specific utility function $\tilde{\mathrm{N}} = \frac{1}{2}\mathrm{y}$. However, when $\phi > 1$ and if both y and $\bar{y}$ increase when we increase y, relative social status can worsen leading to an increase in ϕ and a net reduction in $\tilde{\mathrm{N}}$.

$$\frac{d\tilde{N}}{dy} < 0 \ \text{ iff } \mu\sigma > \frac{1+\phi}{\phi} \qquad (7)$$

Where, $\mu = \frac{d\phi}{d\left(\frac{\bar{y}}{y}\right)}.\frac{\bar{y}/y}{\phi}$ and $\sigma = \frac{d\left(\frac{\bar{y}}{y}\right)}{dy}.\frac{y}{\bar{y}/y}$.

As y $\longrightarrow$ $\bar{y}$, $\phi\left(\frac{\bar{y}}{y}\right) \longrightarrow 1, \frac{1+\phi}{\phi} \longrightarrow 2.$

As y $\longrightarrow 0$, $\phi\left(\frac{\bar{y}}{y}\right) \longrightarrow \infty, \frac{1+\phi}{\phi} \longrightarrow 1.$

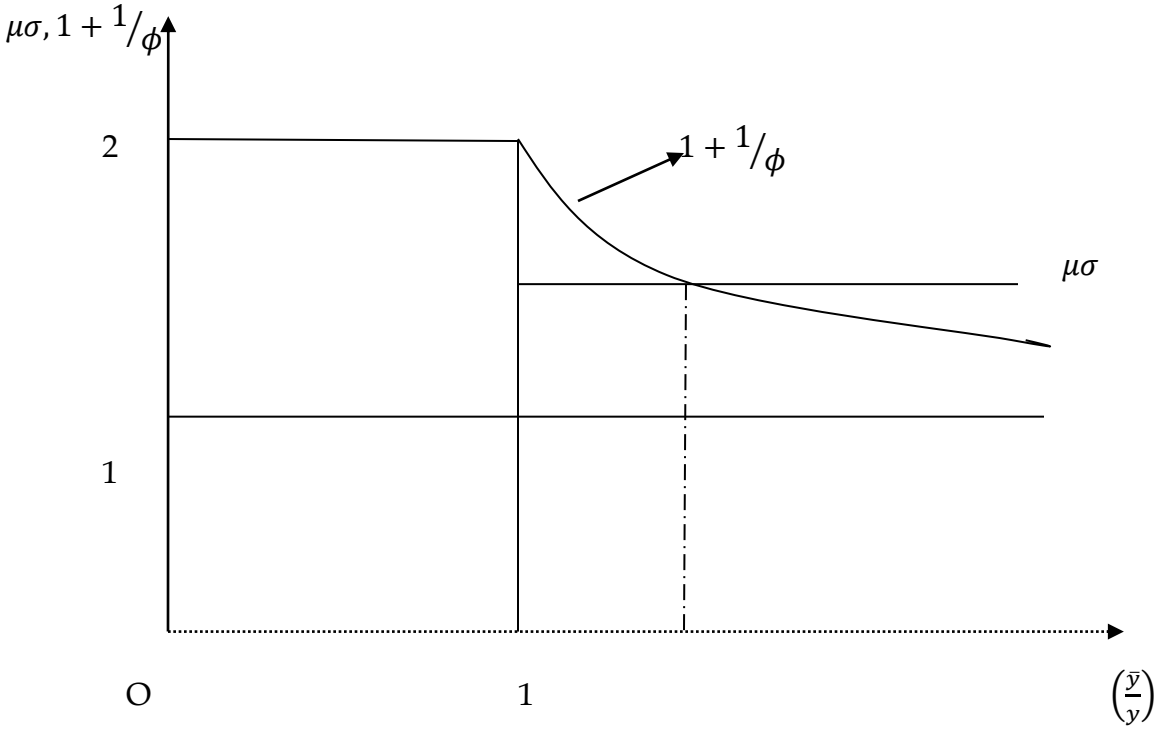

Fig-2

If $\left(\frac{\bar{y}}{y}\right)$ increases with y, the consumption of N reacts according to the magnitude of μ and σ. While μ reflects the cultural perception of relative status, σ reflects the elasticity of distribution. If either of them is very week, we should not have any conflict of measures of poverty. If either of them is zero, we are back with the standard case. If either of them is very high we shall have our interesting results. Also greater is $\left(\frac{\bar{y}}{y}\right)$ and lower is ${}^{1}/_{\phi}$ chances are greater that the conflict will arise. Inequality has a direct bearing on the nutritional estimate of poverty.

Section III

Dynamic Behavior

We shall now highlight the case of inadequate saving by the poor. In fact in our framework we do not need any assumption regarding the behavior of the capital market. We use a simple two-period model which can have a "present and future" interpretation. We have a small open economy where product prices are frozen from the rest of the world. Agents can borrow and lend at a exogenously specified rate of return. Alternatively there is a bond which pays r. Agents can also accumulate capital. The simple two-period model brings out certain essential dynamic features regarding rate of accumulation, status effect and saving.

Two time periods are denoted by subscripts 1 and 2.

The problem facing the agent

$$\max_{\{N_1,L_{1,},N_2,L_2,K\}} f\left(\frac{\bar{y}_1}{y_1}\right)\left[\log N_1 + \phi\left(\frac{\bar{y}_1}{y_1}\right)\log L_1\right] + \beta f\left(\frac{\bar{y}_2}{\tilde{y}_2}\right)\left[\log N_2 + \phi_2 \log L_2\right]$$

Subject to,

$$(y_1 - N_1 - L_{1,} - K)\,(1+r) + y_2(K) - N_2 - L_2 = 0$$

Where, $\tilde{y}_2 = y_2(K) + \mathrm{s}(1+r)$ and s=$(y_1 - N_1 - L_{1,} - K)$. K stands for investment. y_1 is considered as given to start with and $0 < \beta < 1$ is the discount factor.

Optimization and simple manipulations yield

$$\frac{f_1}{N_1} + \beta A(1+r) = \beta\frac{f_2}{N_2}(1+r) \qquad (8)$$

Where A=$\left[f_2'\left(\frac{\bar{y}_2}{\tilde{y}_2^2}\right)\Omega_2 + f_2\phi_2'\left(\frac{\bar{y}_2}{\tilde{y}_2^2}\right)\log L_2\right]$

Ω_2= optimal value of the second period utility.

$\{\tilde{N}_1, \tilde{L}_{1,}\tilde{N}_2, \tilde{L}_2, \tilde{K}\}$ are to be treated as optimal values.

From (5) it follows that A<0.

Now,

$$\widetilde{N}_2 = \frac{\widetilde{N}_1(1+r)\beta f_2}{f_1+\beta\ A\ N_1(1+r)} \tag{9}$$

Similarly,

$$\tilde{L}_2 = \frac{\tilde{L}_1(1+r)\beta f_2\phi_2}{f_1\phi_1+\beta\ A\ L_1(1+r)} \tag{10}$$

Also note that, $y_2'(\widetilde{K}) = (1+r)$ (11)

Equation (11) is a significant condition because even if increasing $\widetilde{K}$ improves future utility apart from income, so long as r is given exogenously, the rate of accumulation does not change. Note the difference between this structure and the status driven growth models. Social status is likely to increase K. But given that the alternative return is (1+r) as derived from the bond, marginal product must adjust to (1+r). Thus the level of K remains the same with or without concerns for status as long as r does not change.

Let us now compare the amount of savings with or without concerns for social status.

$$\widetilde{N}_1 + \tilde{L}_1 + \frac{\widetilde{N}_1(1+r)\beta f_2}{f_1+\beta\ A\ \widetilde{N}_1(1+r)} + \frac{\tilde{L}_1(1+r)\beta f_2\phi_2}{f_1\phi_1+\beta\ A\ \tilde{L}_1(1+r)} = y_1 - \widetilde{K} + \frac{y_2(\widetilde{K})}{(1+r)} \equiv R(\widetilde{K}) \tag{12}$$

With $f = \phi = 1$ and A=0 we get the standard outcome.

$$N_1^0 + L_1^0 = \frac{R(\widetilde{K})}{[1+\beta(1+r)]} \tag{13}$$

Note that, $K^0 = \widetilde{K}$ and under steady state $N_1^0 + L_1^0 = \frac{R(\widetilde{K})}{2}$

Therefore,

$$\tilde{N}_1 + \tilde{L}_1 + \frac{\beta(1+r)\tilde{N}_1}{1+\beta(1+r)}\left[\frac{f_2[1+\beta(1+r)]}{f_1+\beta\, A\, \tilde{N}_1(1+r)} - 1\right] + \frac{\beta(1+r)\tilde{L}_1}{1+\beta(1+r)}\left[\frac{f_2\phi_2[1+\beta(1+r)]}{f_1\phi_1+\beta\, A\, \tilde{L}_1(1+r)} - 1\right] =$$

$$\frac{R(\tilde{K})}{[1+\beta(1+r)]} = N_1^0 + L_1^0 \qquad (14)$$

Two sources of saving S and K are financed by $=[y_1 - (\tilde{N}_1 + \tilde{L}_1)]$. Therfore a direct comparison between $(\tilde{N}_1 + \tilde{L}_1)$ and $(N_1^0 + L_1^0)$ will be relevant.

(14) suggests the following

A set of sufficient conditions, that guarantee aggregate saving to be lower in the case with the concern for social status, are

$$\left.\begin{aligned} f_2 &< \frac{f_1+\beta\, A\, \tilde{N}_1(1+r)}{[1+\beta(1+r)]} \\ f_2\phi_2 &< \frac{f_1\phi_1+\beta\, A\, \tilde{L}_1(1+r)}{[1+\beta(1+r)]} \end{aligned}\right\} \qquad (15)$$

Consider the case that the income distribution is invariant over time i.e. $f_1 = f_2$ and $\phi_1 = \phi_2$. However, $f < 1$ and $\phi > 1$ as $\bar{y} > y$. [If $f_1 = f_2 = \phi_1 = \phi_2 = 1$, then we are dealing with the standard case.] Under this situation (15) can never hold as A<0. Therefore saving will be greater than in the normal case. Strong implication of this observation is that if social inequality is not changing overtime, agents wish to save more to improve their situation. Even if extra dose of K is not forthcoming as $K^0 = \tilde{K}$, saving in terms of the other asset should be greater. This is also the basic intuition behind status driven growth literature, the so-called positive effect of concern for status. Better status gives better utility.

Next consider the case that ceteris paribus, $\bar{y}_2$ is really really high relative to $\bar{y}_1$ i.e. the rest of the society, possibly those with income level much greater than the agent are going to grow substantially so that f_2 is really low relative to f_1 and $f_2\phi_2$ relative to $f_1\phi_1$, then (15) will hold and $(\tilde{N}_1 + \tilde{L}_1) > (N_1^0 + L_1^0)$. Therefore, aggregate saving will be lower. The intuition is that if the agents perceive that their social status will be eroded substantially in the future they will prepone their consumption reducing saving.

Consider the case where f and ϕ matter but not their change. So $f_2' = \phi_2' \simeq 0$. This will make $A \simeq 0$. Then it is entirely between f_1 and f_2 or $f_1\phi_1$ and $f_2\phi_2$ and how low is f_2 relative to f_1. Thus apprehension about future has a direct impact on current saving.

If we wish to compare the static and dynamic case one feature is very clear. In the poverty problem ϕ is very important in determining the trade-off between N and L whereas in the dynamic case it is really f that is critical.

Section IV

Concluding Remarks

The purpose of this paper has been twofold. First, to provide a theoretical explanation behind the conflict between nutrition and income based measures of when consumption depends on relative income status. The second motivation has to do with the relevance of status driven consumption behavior leading to inadequacy of saving by the poor. The simple dynamic model identifies the trade-off between saving augmenting and saving reducing effects of social status.

The log-linear utility function we work with yields standard outcomes when the concern for social status is absent. But drastic alterations of results are possible when we introduce the idea of relative social status in an otherwise simple utility function.

The large body of literature has discussed various types of economic problems under the assumption of concern for relative social status. Our approach is specific and more focused. The result on the measurement of poverty yields a theoretical insight towards one of the most worrying consequence of growth. The result on saving is derived independent of any added assumption on credit market or any other behavioral assumption such as bequests.

In our analysis we have normalized prices to unity as we do not consider the impact of price variations. Consider the case where relative price of N (or L) is allowed to change. It is straight forward to argue that relative price of N will be lower in country

with greater degree of inequality, other things remaining the same. Therefore an economy with more skewed distribution of income will export the nutrition good and import the luxury good. The extent of inequality thus becomes a determining factor behind "comparative advantage". A more equitable distribution worldwide will increase relative price of food.

References

Banerjee, A and Duflo,E (2007). "The Economic Lives of the Poor," Journal of Economic Perspectives, vol. 21(1), pp 141-168.

Beath, J and Fitzroy, F. (2010). "Status, Hapiness and Relative Income," mimeo, University of St. Andrews.

Cole,H. L , Mailath, G.J and Postlewaite, A. (1992). "Social Norms, Savings Behavior, and Growth", Journal of Political Economy". 100(6), pp 1092.

Corneo, G and Jeanne, O. (1998.) "Social organization, status, and savings behavior," Journal of Public Economics, 70(1), pp 37-51.

Deaton, A. and Drèze, J (2009) "Food and Nutrition in India: Facts and Interpretations," Economic and Political Weekly, 44(7), pp. 42-65.

Fafchamps, M. and Shilpi, F.(2008). "Subjective welfare, isolation, and relative consumption," Journal of Development Economics, 86(1), pp 43-60, .

Galor, O. and Zeira, J. (1993). "Income Distribution and Macroeconomics," Review of Economic Studies, 60(1), pp 35-52.

Ghiglino, C and Goyal, S (2008). "Keeping up with the neighbors: social interaction in a market economy", mimeo, University of Essex.

Hopkins, E and Kornienko, T (2010). "Which Inequality? The Inequality of Endowments Versus the Inequality of Rewards", mimeo, University of Edinburgh.

Kanbur, R. and Toumala, M. (2009). "Relativity, Inequality and Optimal Nonlinear Income Taxation", mimeo, University of Tampere.

Ku, H and Salmon, T. C. (2009). "Incentive Effects of Inequality and Economic Development", mimeo, Florida State University.

Moav, O. and Neeman, Z. (2010). " Status and Poverty", Journal of the European Economic Association, 8(2-3), pp 413-420.

Patnaik, U (2007). " Neoliberalism and Rural Poverty in India", Economic and Political Weekly, 42(30) 28th July, pp 3132-50.

Sivanathan,N. and Pettit, N. C. (2010). "Protecting the self through consumption: Status goods as affirmational commodities", Journal of Experimental Social Psychology, 46(3), pp 564-570.