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Social Norms of Body Shape and Nutritional Policies

The implementation of a nutritional policy by the recent "Plan National Nutrition Santé" (PNNS - National Nutrition and Health Programme) raises the question of the relative effectiveness of policy tools, such as price interventions and information campaigns. However, social interactions between consumers are likely to complicate policy evaluation. More precisely, suppose that a public policy has a direct effect on consumption behaviours and that, by aggregation, individual behavioural changes alter certain social norms. These norms may in turn influence individual behaviours. The overall effect of the public policy is the sum of a direct and immediate effect on individuals, and an indirect effect through social norms. With this in mind, we here present the results of a quantitative study, which identifies the impact of social norms of body shape on ***individual*** *representations of ideal body and the effect of the latter on nutritional attitudes. Hence, the research asks whether collective representations of the ideal body are a parameter that must be taken into account in the economic analysis of nutritional health policies.*

Introduction

The reduction of overweight and obesity in adults and children is one of the nine targets of the PNNS. An adult is overweight if her/his body mass index (BMI: weight in kilograms divided by height squared) is over 25 and obese if his BMI is over 30 (see frame 1). According to this indicator, between 1990 and 2002 the prevalence of overweight in the French adult population went from 29.7% to 37.5% (OECD Health Data, 2005). This physical condition is a risk factor for many chronic illnesses (diabetes, mobility disorders, heart diseases). As a consequence, the medical overcosts of obesity are growing, and will be even more important in the future as young generations are more concerned than the older ones. To illustrate this point, in 1990 the additional medical cost generated by an obese individual was between 150 and 350 euros. Since, in France, all individuals are covered by the Social Security, whatever their efforts to stay fit, there is a problem of "ex-ante moral hasard". A solution would be to modulate social security contributions according to the efforts of prevention observed among the insured. As the Social Security's founding principles forbid this kind of discriminatory measure, other policies are proposed or implemented: disseminating targeted or generic information, food price interventions, banning or regulating sales of certain food products, and so on. Assessing their expected benefits requires, among other things, that social interactions be considered, as they may multiply or nullify their effects. In this perspective, we here present some research results on the ways social norms of body shape are formed and their link with consumers' nutritional attitudes (Etilé, 2007).

Social interactions and social norms in economics

For economists, social interactions between rational individuals belong to one or another of these three categories: constraint interactions (seen in competition for a limited resource, for instance); information interactions (*cf.* the informational cascades, that may explain herd behaviours on financial markets); and preference interactions, wherein individual preferences depend on the distribution of actions and/or preferences within a reference social group (Manski, 2000). Regarding preference interactions, theoretical models usually assume that the deviation between the action **selected** by the agent (here, his BMI) and the average decision of members of the reference group (the mean BMI in the group) affects her/his well-being. If well-being decreases with the deviation from the average, then the agent has a preference for conformism (or an aversion for stigmatisation) which can be interpreted as a social norm effect. Conversely, if well-being increases with the deviation, then the agent has a preference for distinction (Akerlof, 1997).

However, this approach to norms and distinction raises two problems:

- It gives no indication on the choice of the reference group. Many quantitative studies mimic the sampling design of the survey they use to form *ad hoc* reference groups (for instance, the school in a survey on teenagers snacking). But as recommended by Manski (1993), it is more appropriate to define these reference groups with information obtained from qualitative, socio-ethnographic, studies.
- Although reducing a social norm to a behavioural regularity eases the construction of an empirical measure (means or medians can be easily computed from well-defined variables), the

system of values and collective expectations, which underlie social norms, are forgotten. For example, the norm for murder is "thou shall not kill" rather than the prevalence of manslaughter in the population.

Against this reductionism, Akerlof and Kranton (2000) suggest an alternative approach to social norms, that they call **prescriptions**, which is grounded on two assumptions. The social reference group is the group to which the individual is exogenously assigned (because of his age, gender and his financial or human capital). Second, prescriptions are shared expectations on how the group's members must behave or on the attributes they must have (here, a specific body shape). This is the approach we intended to implement.

Social norms and individual representations of the ideal body

The research is based on the French Institute of Statistics' survey on households' living conditions "Enquête sur les conditions de vie des ménages" (INSEE, 2001), which collects information on actual and ideal body weights, actual height and a number of nutritional attitudes for more than 5,000 individuals (see frame 2). It is then possible to construct measures of actual and ideal BMIs, which are supposed to summarise respectively the individual's actual and ideal body shapes.

Several works in social psychology have showed that, from a phenomenological point of view, it is difficult to distinguish the attributes that the individuals would like to possess (the ideal attributes) from those they think they ought to have in order to conform to the expectations produced within their assigned social category. For instance, following Bourdieu (1979), working class members are expected to be strong and, in some sense, "large", while executives and white collars ought to be slim and smart. As a consequence, each individual's ideal BMI must contain information about the body shape prescriptions prevailing in her/his social group. One way to extract this information is to compute the average ideal BMI in this group. This yields a measure of the social norm of body shape. Yet, the definition of the social group of assignation has to be precised. We **initially** relied on Bourdieu (1979)'s study of the role played by body shape in the distinction between socio-professional categories (SPC), and on a sociological work, which has shown that, in France, ideal BMI is lower for executives and intermediate professions than for workers and employees (Régnier, 2006). The assignation group was then **initially** defined by crossing age (individuals with a maximum 5 year difference in age), sex and the socio-professional category (SPC in 12 categories). Including social stratification in the definition of the social group modified the results slightly and weakened their robustness in a significant way. The results presented here, the most robust ones we have, are therefore based on assignation groups only defined from the age and sex criteria.

Nearly 40% of individuals consider that their ideal weight is their actual weight, which is interpreted by assuming that individual representations of ideal body shape are produced, on the one hand, by social norms and, on the other hand, by the application of a principle of reality - "to be satisfied with what we have"-, which is a cognitive strategy that helps to cope with life and preserve well-being. Finally, the model underlying the empirical analysis supposes that social norms and habitual body shape jointly determine individual representations of ideal body shape (ideal BMI), which in turn affect food behaviours. Actual body shape (that is to say BMI) at the moment of the survey is an approximate measure of habitual body shape. Figure 1 summarises the model, while Frame 3 presents the estimation method

Table 1 reports the main results, by gender, for those men and women who want to lose weight (ideal BMI lower than actual BMI). It is found that for women, a 1% increase in the social norm (the average ideal BMI in their assignation group) induces a rise of nearly 0.5% in ideal BMI. For men, a similar variation of social norm would have no effect on ideal BMI. This gender difference is consistent with results of the international literature on the impact of beauty stereotypes, which is much mode important on women. A 1% variation in habitual BMI produces a 0.5% rise in ideal BMI of women and a 0.8% rise for men.

For instance, a woman whose social norm prescribes her a weight of 60 kg would declare an ideal weight 450g higher when the norm goes up to 61 kg. In the same way, a price policy, which would reduce usual BMI by 1% would directly lowers the ideal BMI of those women who want to slim by a minimum of 0.49%. As all group members simultaneously modify their representations, the average ideal BMI of the group - the social norm - would also move downward. *In fine*, a second -0.54% drop in each individual's ideal BMI, indirectly caused by a modification of the norm, would reinforce the (-0.49%) direct effect. This second effect would not be observed in men.

Weight, ideal weight and nutritional attitudes

We can now turn to the predictive value of the variables we use, and ask whether individual food behaviours are affected by the deviation of their usual BMI from their ideal BMI. Although the survey does not give precise information on these behaviours, it informs on some nutritional attitudes that measure somehow the healthiness of the individual's diet. Then, we can estimate the correlations (everything else equal) between these attittudes and the deviation between actual and ideal BMIs. Table 2 gives the sign of the coefficients that are significant at the 5% level.

The more weight an individual would like to lose, (BMI^h-BMI^* increases), the less balanced he estimates that his food diet is, and the more likely he will eat low-fat and low-sugar products and will avoid excessively rich food. Conversely, individuals who would like to put on weight (BMI^* -BMI^h increases) declare less often that they pay attention to fat and sugar. Furthermore, in these estimates, social norms have little effect on nutritional attitudes (just one significant coefficient out of four). In other words, the impact of social norms is only indirect, and works through a modification of individual representations of ideal body shape.

In the end, while for women the effects of social norms on individual representations of ideal body shape are significant, this is not the case for men. This gender difference could partly explain why female obesity has increased more quickly than male obesity (+64% between 1997 and 2006 against 40% for men): for women, the impact of environmental changes (fall in prices, advertisement pressure, and so on) is all the stronger that they induce modifications of social norms, which amplify their effects. This analysis sheds light on the effect of global norms specific to large social groups. It could be extended to analysis of the impact of norms produced by media or norms produced more locally at the neighbourhood scale or school scale.

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For further information

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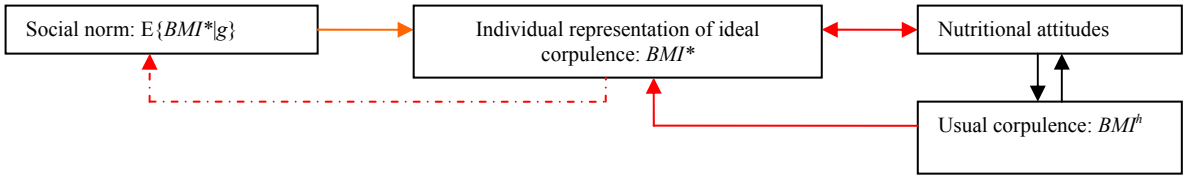
Figure 1: The model structure



Note: the red continuous arrows represent the relationships that the research intends to identify. A bijective arrow indicates a simple correlation, while a single arrow indicates a potentially causal relationship. *BMI** is ideal BMI. BMI^h is habitual BMI, approximated in the estimation by actual BMI. E{*BMI**|*g*} is the mean ideal BMI in the social group *g*.

Table 1: Main results

Sample	**Women who wants to lose weight (N=1341)**	**Men who wants to lose weight (N=767)**
Dependent variable	*Logarithm of ideal BMI (log(BMI*))*	
Logarithm of the social norm (log(E{*BMI**|*g*})	0.524*	-0.022
Logarithm of the usual BMI (log(BMI^h))	0.490*	0.784*
Hansen test (p-value)	0.197	0.313
Stock et Yogo test: relative Bias IV *versus* LOS	5-10%	20-30%

Note: Coefficients are to be interpreted as elasticities, everything else equal (income, family situation, and living place). *=significant at the 1% level. The Hansen statistic p-value shows that the choice of the instrumental variables (IV) is correct. For women, the relative bias in the estimates (difference between estimated coefficients and their «true» values) is at most 10% of the bias that would be produced by the ordinary least squares (OLS). In other words, according to this criterion**, the instrumental method reduces the instrumentation bias by a factor 10 relatively to OLS (3 for the men estimates)**.

Table 2: Correlations between nutritional attitudes and representations of body shape

Dependant variable	**Thinks has a balanced food diet**	**Consumption of low-fat products**	**Consumption of low-sugar products**	**Avoids excessively sweet and fat products**
Satisfied or wants to gain weight ($BMI^* - BMI^h$ if $BMI^* \geq BMI^h$, 0 otherwise)	-	-	0	-
Wants to lose weight ($BMI^h - BMI^*$ if $BMI^* < BMI^h$, 0 otherwise)	-	+	+	+
Social norms (log(E{*BMI**|*g*})	0	0	-	0
Usual BMI (log(BMI^h))	0	+	+	0

Note: Correlations everything else equal (age, sex, income, SPC, family situation, living place).

Frame 1 - BMI and Body Shape

In a very simplistic way (but in this matter, data are scarce), we here summarise body shape by the body mass index (BMI), obtained by dividing weight in kilograms by height squared. According to the World Health Organization (WHO) medical norms, an individual is overweight when her/his BMI is over 25 kg/m^2, and obese if her/his BMI is over 30 kg/m^2. BMI is a good predictor of overweight-related morbidity, and health risks significantly increase when it goes beyond the threshold of 27 (and not 25). However, the BMI does not take into account the distribution of weight in muscle and fat and cannot be a good summary of some individuals' body shape (in particular, or those who do "physical" jobs), even though it was demonstrated that the correlation between BMI and the distribution of weight between fat mass and muscular mass is quite high, whatever the age, sex, ethnic origin or physical activity level

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Frame 2 - Survey on households' living conditions 2001

In 2001, in addition to usual information on socio-demographic characteristics and living conditions, the INSEE survey on households' living conditions contained detailed information about the nutritional attitudes and health behaviours and status of 5,198 individuals belonging to as many households representative of the whole population. Individuals were asked in particular to declare their height and the weight they "would like to have". This last variable is interpreted as a measure of ideal weight and, divided by height in meters squared, provides a measure of ideal body shape (ideal BMI).

Frame 3: The econometric analysis

The econometric analysis focusses on the estimation of the equation that describes the formation of individual representations of ideal body shape. Let respectively BMI^* and BMI^h be ideal and habitual BMI. The latter is proxied by actual BMI. $E\{BMI^*|g\}$ is the mean ideal BMI in the individual's assignation group g, in other words, our measure of the social norm. The equation to be estimated is as follows:

$$BMI^* = \alpha\, E\{BMI^*|g\} + \beta\, BMI^h + \delta X + \eta$$

where X is a set of control variables and η an error term. Manski (1993) showed that estimating this equation by ordinary least squares (OLS) does not identify α, because the correlation between BMI^* and $E\{BMI^*|g\}$ is the product of three effects: (1) a direct influence effect of social norms (**direct causality**); (2) a reflection effect due to the fact that the BMI^* individual representations of each group member g and then, their average, depend on each individual's ideal BMI (**reverse causality**); (3) a contextual effect due to the fact that group members are influenced by similar information flows about the ideal body shape (same medical information on what is a "healthy" weight, same standards of beauty proposed by the media, and so on, or any other **third variable observable or not**). To identify the first effect, which is the focus of the research, $E\{IMC^*|g\}$ is instrumented by a set of instrumental variables (
IV), whose validity is assessed by a Hansen-Sargan test (orthogonality of the instruments with the error term η) and a Stock and Yogo test (which examines whether instruments correctly predict the instrumented variable).

Last, the joint endogenous nature of social norms and habitual BMI renders impossible the identification of a system of equations that would describe the formation of individual representations and the effect of these representations on actual BMI (because instruments lack). This is the reason why, more modestly, we just have a look on the relationships between individual representations and nutritional attitudes.

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