

## **Endogenous Preferences:**

### **A Structural Approach**

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**T**his paper speaks to one of the key assumptions in the rational model as assumed by neo-classical economists. This assumption is that preferences are exogenous, that they are determined by forces outside the system, and that they are unchanging through time. In contrast, I will propose a model of endogenous preferences, one that captures the dynamics of preference formation as people interact with one another. This model preserves the mathematical simplicity and analyzability of modern economic theories and permits the derivation of an equilibrium of preferences in a complex dynamic system.

#### **A Brief History of Exogenous Preferences**

In their ground-establishing article, "De Gustibus Non Est Disputandum," Stigler and Becker make two claims about preferences: (1) individuals' basic tastes do not change over time, and (2) individuals do not differ from one to another in their tastes. To emphasize this point, they compare tastes to the Rocky Mountains: "Both [tastes and the mountains] are there, will be there next year, too, and are the same to all men" (76).

They recognize that this stand would be controversial, suggesting that a "generation of economists" will not be able to defend against the anticipated deluge

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of questions and counterexamples. But they assure the reader that it is not their intent to explain all rich social phenomena via utility theory. Rather, they defend their approach as one that “offers guidance in tackling these problems—and that no other approach of remotely comparable generality and power is available” (77).

To demonstrate this power, Stigler and Becker (formalized and extended by Becker and Murphy 1988) provide an example of how “addictive” behaviors, which on the surface seem to be clear indications of changes in tastes over time, can be explained by appealing to the concept of “consumption capital.” Consumption capital represents the degree to which experience with a good or service reduces the cost of that good or service. As a consumer gains experience with a good (such as heroin), it is easier to acquire and use (one knows better where to get it and better how to administer it, etc.). Thus, the cost of using it goes down as use goes up, resulting in higher marginal “profit” (gains in utility minus costs). As the marginal utility diminishes with ever-higher usage, equilibrium is reached when the diminishing marginal utility gains match the reduction in cost obtained by increases usage (i.e., increased consumption capital).

In the Becker and Murphy heroin example, they show three equilibrium points: no usage (a stable equilibrium), moderate usage (a saddle point, likely to result in movement to one of the other two equilibria), and addiction (a stable equilibrium). They note that these equilibria and predictions are consistent with what people who work with such addictions have found in the field.

The benefits of such a model, they argue, are that one does not have to resort to ad hoc explanations like “needs” or “different tastes,” which are the purview of a whole bag of social scientists (Stigler and Becker [1977, 76]. They wonder aloud whether such a bag includes phrenologists right alongside the psychologists and sociobiologists): “We believe that the phenomenon Marshall is trying to explain, namely that the exposure to [some good] increases the subsequent demand for [the good] (for some persons!), can be explained with some gain in insight by assuming constant tastes, whereas to assume a change in tastes has been an unilluminating ‘explanation’” (78).

There are many structural sociologists who would agree on this point about tastes constituting an unilluminating explanation. Mayhew (1980) passionately argued that social scientists of all stripes, including sociologists, too often resort to differential tastes, needs, or desires as explanations of behavior: “The individualists [social scientists who appeal to such explanations] do not seem to have grasped the elementary principle that one does not explain a set of data by simply repeating it. To say that ‘people do things because they want to’ is not an explanation (nor even an interpretation) of what people do: it is a restatement of the (individualist’s) data. It is not different from saying that people do things because they do things” (355).

Encouraged by Becker and his colleagues, other economists have followed suit and begun to explain many social phenomena that used to be the domain of sociologists. For example, Manski (1993a) has developed a model that explains why underclass youth underestimate the return on education (thereby appearing to "value" education less) (see also Manski 1993b; 1995). Montgomery (1994) draws on the consumption capital idea to show why husbands of lower-class families would appear to "value" their families less.

Even sociologists have begun to incorporate utility-maximizing explanations as core to their models of human behavior (e.g., Coleman 1990; Burt 1982). Pertinent to the point of this paper, two political scientists (Cohen and Axelrod 1984) have suggested that people often learn that their underlying beliefs about the probabilities of outcomes are wrong. Faced with such "surprises" (defined as the difference between what they expected and what they observed), they not only modify their estimates of the probabilities, but their experience "is also used to modify the very utility function that is being maximized" (39).

Becker and his colleagues are to be commended for developing a consistent and powerful theory that does not resort to trivial logical tautologies. As shown in just these few examples, their efforts have succeeded in guiding many subsequent studies of macro social behavior. But that social phenomena *can* be explained by some theory does not imply that the theory is correct.

### The Structuralist's Perspective

I now turn to an alternative, one that does not resort to setting up a tautology based on tastes, but does attempt to explain variance in tastes endogenously. It rests on the axiom that people influence each other in their beliefs, values, tastes, and virtually every other cognitive or affective process in which they engage. This axiom certainly is well-founded in the literature on social psychology and sociology, and I would argue is at least as robust as the utility-maximizing assumption about rational behavior. It is not my purpose here to argue this axiom, but only to state it as a starting point, from which I derive the following formal model about preferences.

To state that people influence each other is too general. I am speaking of influence that occurs as a byproduct of direct interaction.<sup>1</sup> Thus, not everyone influences everyone else. In fact, no one influences everyone else. While some of

<sup>1</sup> I will ignore the indirect kind of influence that may occur at a global level, for example, the effect that my congressperson might have on me even though I have never talked to her. Nor am I referring to indirect ripple effects that rumors might have on individuals: No doubt these social influences can affect one's preferences, but they are outside the scope of the model I am developing here.

my colleagues at Carnegie Mellon University influence me a great deal, others do not. Nonetheless, what I value, what I like, and what I aspire to, are all in part influenced by particular others in my social history.

The exact form of this influence is difficult to specify and is the appropriate object of empirical research, but I will start with simplifying assumptions about the form to make the models tractable. I will develop a dynamic model that suggests an equilibrium state for preferences within a given influence structure. The model suggests how to assess the extent to which preferences, and other variables of interest to social scientists, are affected by the social influence process I am proposing.

### Equilibrium within an Influence Structure

Consider the case where one's preference at time  $t$  (designated as  $U_t(i)$  for person  $i$ , or  $U_t$  for all persons) for a good, service, outcome, or whatever, is influenced by the preferences of a set of actors in the system (including self).<sup>2</sup> Let us further assume that the extent to which any other actor  $j$  influences person  $i$  is given by some weight,  $w_{ij}$ . To this point, I have not stipulated exactly how this influence might take place, except to say that it is a joint function of the opinions of all actors in the system, weighted by  $W$ . So, for an individual,

$$U_t(i) = \sum w_{ij} U_{t-1}(j). \quad (1)$$

For the entire set of individuals, these equations can be represented in matrix notation as:

$$U_t = W U_{t-1}$$

The question is, what is the nature of  $W$ ? That is, how are utilities affected through associations with others?

The truth is,  $W$  could take on many forms, each of which would depend on a social theory of preference influence. I will restrict myself in this paper to a theory premised on the following two assumptions:

**Assumption 1: Principle of Interaction.** The degree of influence person  $j$  has on person  $i$ 's preferences is proportional to the amount of time  $i$  and  $j$  spend interacting with each other.

That is, the more time  $i$  and  $j$  spend interacting, the more they will influence each other in their changes in preferences over time. I also assume here that a

<sup>2</sup> I will, for the moment, constrain  $U_t$  to be positive real. An extreme value of 0 would represent indifference to the good, while increasing positive values would represent increasingly positive value placed on the good.

person can influence herself ( $= w_{ii}$ ). This parameter represents a person's obstinacy, or what psychologists might call the individual's personality. To the extent that these diagonal elements are large relative to the off-diagonal values in  $W$ , we are assuming that preferences are exogenous and relatively stable over time, untempered by the preferences of others. In the extreme case, if  $w_{ii} = 1$  for all  $i$  and  $w_{ij} = 0$  for all  $i \neq j$ , then we are reduced to the model that Becker claims: preferences are exogenous and stable over time. To the extent that the  $w_{ii}$ 's are small, individuals are assumed to be quickly influenced by their social neighbors.

This is a very reasonable assumption, one that has much support in the social psychological science literature (e.g., Festinger 1954; Friedkin and Johnsen 1990; Marsden 1981). It has appeal in that it shows how people are both dependent on and independent of each other.

But it also assumes symmetry, that is, it assumes that when two people interact, they influence each other to the same extent. We can increase the sophistication of this model by recognizing that some people *respond* differently to the same amount of interaction with others. It would be tempting here to suggest that such responses are personality-based ("bad chemistry," for example), but to do so would be to fall into the same trap that Mayhew warned us against, that of explaining the outcome by describing the outcome. Instead, I will use a structural assumption about how people respond differently to the amount of time they spend with each other.

**Assumption 2: Principle of Reflected Exclusivity.** The degree of influence person  $j$  has on person  $i$ 's preferences is *inversely* proportional to the amount of time person  $j$  spends with all others (including self).

This assumption requires somewhat more explanation. For illustration, let us assume that Stephen interacts for the same amount of time with two people, Sheila and Josephine. According to Assumption 1, Sheila and Josephine each should contribute equally to Stephen's re-formulation of his preferences. But, suppose further that Sheila is a gregarious individual, and that she interacts with everyone. Suppose that Josephine, on the other hand, confides solely in Stephen. He sees Josephine's interactions as focused on him, singling him out as someone worth investing in. Thus, while both women objectively spend just as much time with Stephen, he weighs more heavily the investment that Josephine makes in him. Therefore, Josephine has more influence on Stephen's views of the world than does Sheila.

There are two separate rationales for this assumption, one emphasizing the target of influence, and one emphasizing the source. For the first, there is an appreciation of the time devoted by the actor. Stephen recognizes that Sheila's time investment in him is not particularly aimed at him, but that Josephine's is

