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## **SCHELLING, THOMAS C. (BORN 1921)**

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Thomas Schelling has contributed path-breaking works to the study of coordination problems, group behaviour, and self-control. Early in his career, he framed the Cold War as a game in which parties have a mutual interest in coordinating their actions through a 'focal point'. Later he explained how, in the absence of racism, racial segregation may be triggered by a 'tipping' process through which residential homogenization feeds on itself. His latest major insight has been that addictions stem from an inability to reconcile conflicting inner drives.

Thomas Schelling was born in 1921 in Oakland, California. He received a BA from the University of California at Berkeley in 1944 and a Ph.D. in economics from Harvard University in 1951. Between 1948 and 1953 he worked in foreign aid bureaus in Washington, mostly on negotiations. He taught at Yale University (1953–8), then at Harvard University (1958–90), and finally at the University of Maryland at College Park (1990–2003). He also had a long association with the RAND Corporation, with appointments as an adjunct fellow for most of his career (1956–2002) and as a full-time researcher in 1958. He was awarded the Nobel Prize in economics in 2005.

Schelling is known for works that use the tools of economics to illustrate major social phenomena while also making foundational theoretical advances. His publications illuminate patterns and paradoxes concerning military strategy and arms control, nuclear proliferation, conflict and bargaining, coordination and conventions, tipping points and critical mass, racial segregation and integration, addiction, health policy, and business ethics. In terms of style, he has avoided the formalization that now characterizes most economic research. Using mathematics sparsely, he has managed to convey intricate theoretical arguments mainly through eloquent prose and penetrating examples.

In the 1950s, when Schelling's academic career took off, policymakers around the globe were consumed by the rivalry between the two nuclear-armed superpowers, the United States and the Soviet Union. His first classic book *The Strategy of Conflict* (1960), framed the challenge facing the two sides as coordinating on a commonly expected and mutually acceptable outcome. Avoiding nuclear confrontation required the negotiators to focus on a particular set of concessions. The underlying logic, Schelling proceeded to show, applies to a very broad set of problems in which communication is incomplete, if not impossible. People who have a mutual interest in coordinating their behaviours will

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look for a ‘focal point’ capable of generating a common expectation as to what is feasible.

One of his famous examples involves two strangers who are instructed to meet each other on a particular day in New York City. Unable to communicate, they look for an obvious place to meet, so obvious that each will know that it is obvious to both of them. At the time that Schelling was writing, the information desk at Grand Central Station provided just such a focal point. In this case, people achieved coordination not by speculating on what the other would do but by identifying a common course of action with the understanding that the other party was trying to do the same. Typically, the solution entailed a set of actions that stood out among its numerous alternatives. Hence, there was no uniquely ‘correct’ answer. What made an alternative ‘correct’ was simply that enough people thought so.

In a class of contexts, the required focal point lies in the structure of the game being played. For instance, in certain games with multiple equilibria it consists of a Pareto-dominant equilibrium – an outcome that no one can improve upon without harming at least one other player. Schelling’s key insight, which the Grand Central Station experiment encapsulates, is that in a wide range of other contexts the focal point emerges from factors not captured by a formal representation of the game. It may depend on such factors as analogy, precedent, accidental arrangement, symmetry, aesthetic configuration, even on what the parties know about each other.

*The Strategy of Conflict* laid the foundations for a version of applied game theory that focuses not on zero-sum games in which players have diametrically opposed interests but on positive-sum games in which the players have both common and conflicting interests. The nuclear arms race offered the paradigmatic case: each superpower wanted to avoid touching off a mutually destructive nuclear showdown but also to dominate the other. In identifying lessons for policymakers, Schelling played a pioneering role in the development of various concepts included in the basic toolkit of modern game theory: commitment, credibility, threats, and brinkmanship. He also introduced, albeit informally, the concept now known as subgame perfection, which is a generalization of backward induction. His insight that mutual nuclear deterrence requires the threats of adversaries to be credible was an early illustration of an idea now central to thinking about strategic interactions in economics, political science, sociology, and beyond.

Another of Schelling’s classic books, *Micromotives and Macrobehavior* (1978), deals with settings in which a group’s aggregate behaviour is more than the sum of the behaviours of its members. What unites the members is that in acting and reacting to their environment they fail to perceive, and usually do not care, how their own choices combine with those of others to produce unintended and unanticipated consequences for the whole group. One of his influential applications of this insight concerns racial segregation. A popular explanation for racial segregation in American cities was deep-seated racism. Schelling showed that racial segregation could arise even in places where

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racism was not particularly acute. It could emerge, in fact, even in a community whose members all wanted to live in a racially mixed neighbourhood.

To see the underlying logic, consider a population whose members are either white or black. Regardless of colour, everyone prefers to live in a racially diverse neighbourhood. By the same token, each member of the population is also averse to being in the minority, though to varying degrees. Suppose now that a certain neighbourhood is 52 per cent white and 48 per cent black. Because whites are in the majority, the neighbourhood attracts disproportionately many whites. The accentuated imbalance is acceptable to the white majority. Its members do not mind if their share rises, say, to 65 per cent. But black residents who are most sensitive to being in the minority begin to move out, which reduces the proportion of blacks even further. That reduction then triggers further exits. The upshot is that the neighbourhood becomes fully white even though that was not the intention of anyone in either the majority or the minority.

In developing this analysis, Schelling familiarized the social sciences with concepts that have since gained broad applications. One of these is ‘critical mass,’ a short hand for the minimum level of activity, often defined as a number or ratio, required to make that activity self-sustaining. If a neighbourhood will experience black flight once the black proportion falls to 40 per cent, that percentage marks the critical mass of blacks required to keep the neighbourhood integrated. A related Schelling concept is ‘tipping’, which entails a cumulative process dependent on differences in critical mass across individuals. In the presence of such differences, a behaviour can feed on itself. A few black departures can induce further departures by making the share of blacks dip below more individual thresholds, and the process can repeat itself until none remain.

Schelling’s analysis points to the dangers of inferring individual characteristics from observations of collective outcomes, and of jumping to conclusions about aggregate behaviour from what one knows about individual preferences. That individually rational behaviours may generate persistent inefficiencies was already understood. The ‘Prisoner’s Dilemma’ offers a case in point. Schelling’s work on the tensions between ‘micromotives’ and ‘macrobehaviour’ helped to show that such tensions are much more pervasive than had been appreciated. In the case of racial sorting, people who would rather live in a more or less balanced neighbourhood than in a racially homogeneous one end up with the less preferred outcome. Moreover, once racial segregation has run its course, it is difficult to reverse, because few will voluntarily move into a neighbourhood in which they would form a tiny minority.

Identifying analogous tensions in a rich variety of other settings, Schelling demonstrated that market activity can produce lasting inefficiencies when an expectation-driven interactive process shapes the choices of participants. His examples included the custom of sending holiday cards. People feel obliged to send cards, he observed, to people from whom they expect to receive them, even when they sense that they will receive them only because the senders expect to receive cards themselves. Accordingly, two acquaintances may send each other cards for years on end, even though both find the

custom burdensome and each is capable of ending the habit unilaterally. Individuals may keep sending cards to people they have not seen for decades for no other reason than the suspicion that cessation could signal something undesirable. Society as a whole would be better off, Schelling infers, with a ‘bankruptcy proceeding’ through which all holiday-card lists are obliterated to allow people to start over, motivated only by the holiday spirit, without accumulated obligations.

Schelling’s insight into the possibilities of disharmony between ‘micromotives’ and ‘macrobehaviour’ has stimulated a wide range of other studies based on the observation that people fail to account for the externalities of their decisions. Refined or extended versions of his framework have been used to explain, among other phenomena, the emergence and disappearance of clothing fashions, the unpredictability of revolutions, the dynamics of jury decisions, the significance of momentum in political campaigns, the broadening of ethnic cleavages, norms against price competition, and economically dysfunctional behaviours inimical to development. The micro–macro interactions characteristic of Schelling’s works appear also in various network models in which local interactions can trigger unintended and disproportionate global consequences.

Where *The Strategy of Conflict* and *Micromotives and Macrobehavior* address problems involving interactions among people, *Choice and Consequence* (1984), Schelling’s third classic book, focuses on conflicts within individuals. Economics has traditionally treated the individual as a unified and internally consistent utility maximizer. Yet difficulties with reconciling conflicting impulses are central to the human experience. The problem of addiction, Schelling suggests, entails a failure to manage inner conflicts. It arises from inadequate self-control. The key insight of *Choice and Consequence* is that problems of self-control are commonly dampened, if not resolved fully, through tricks of the mind, social institutions, and public policies.

Many American taxpayers understate the number of their dependents to the Internal Revenue Service, the tax collection agency of the American government, to have an excessive portion of their income withheld, thus ensuring a hefty refund at the end of the year. Because excess withholdings yield no interest, this practice amounts to an expensive method of saving. If people find it convenient, the reason is that they see themselves as lacking the self-control to allow savings accumulate in a bank. By placing savings in the custody of the IRS, a person’s responsible and forward-looking self gains control over the impulsive self that coexists with it.

Addictions stem from self-control difficulties, which anti-addiction treatments are designed to address. Obese people who cannot lose weight on their own check into ‘fat farms’ that regulate their diet. Likewise, alcoholics enrol in programmes that either directly limit their access to alcohol or boost their self-control through support networks. In either case, the addict effectively conspires with society to favour his responsible self over his impulsive self. In studying various self-control problems for which social remedies have been devised, Schelling finds that society does not always side with the responsible and forward-looking self. With regard to terminally ill people who are in so

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much pain that they want to die immediately, yet cannot bring themselves to take the final step, in most countries both the law and public morality side with the self that wants to keep living. Thus, people are prohibited from writing legally binding contracts to get assistance with dying.

The fundamental contribution of Schelling's writings on personal self-control has been in spreading awareness of a broad category of human problems that call for social intervention informed by a combination of economics and psychology. Education campaigns aimed at making people understand the consequences of their behaviours will not be effective, at least not by themselves. Most alcoholics know well that their addiction makes them unproductive, unhealthy and socially disconnected. Their troubles stem not from ignorance but from an inability to mediate conflicting demands within themselves. The period since Schelling published these insights has only raised their significance. With obesity now an acute social problem in developed and underdeveloped countries alike, and other addictions spreading as a result of rising prosperity, problems of self-control now lie at the centre of vast research programmes.

Over and beyond his penetrating and often pioneering insights into specific economic, social and political problems, Thomas Schelling has made an enduring contribution to economics and its sister disciplines by showing that a deep understanding of social systems requires attention to cultural context, social dynamics, strategic interactions, and human complexities. To make sense of why a person would deliberately place an alarm clock far away from his bed, one must realize that he may be tormented by warring impulses. Although his problem can be modelled as one of utility maximization, only by taking account of the competition within him can one understand why one possible solution is likely to work better than another. Only by considering the cultural context can one understand why strangers asked to meet each other are more likely to succeed in certain cities and times than in others. No approach limited to the formal properties of payoff matrices, or the strangers' formal decision problems, will suffice. And only by understanding the mechanics of strategic decision-making, and the factors that make threats credible, can one appreciate how the massive nuclear stockpiles of the United States and the Soviet Union allowed human civilization to survive the Cold War.

**Timur Kuran**

***See also game theory and behavioural economics; preference reversals; residential segregation; self-confirming equilibria; signalling; social norms; threshold models***

#### **Selected works**

1960. *The Strategy of Conflict*. Cambridge, MA: Harvard University Press.

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1966. *Arms and Influence*. New Haven, CT: Yale University Press.

1971. Dynamic models of segregation. *Journal of Mathematical Sociology* 1, 143–86.

1978. *Micromotives and Macrobehavior*. New York: W. W. Norton.

1984. *Choice and Consequence: Perspectives of an Errant Economist*. Cambridge, MA: Harvard University Press.

### **Bibliography**

Ayson, R. 2004. *Thomas Schelling and the Nuclear Age*. London: Frank Cass.

Swedberg, R. 1990. Thomas C. Schelling. In *Economics and Sociology*. Princeton: Princeton University Press.

Zeckhauser, R. 1989. Distinguished Fellow: reflections on Thomas Schelling. *Journal of Economic Perspectives* 3(2), 153–64.

### *Index terms*

addiction

critical mass

focal point

game theory

multiple equilibria

network models

prisoner's dilemma

residential segregation

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self-control

subgame perfection

tipping

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