Micromotives and Macrobehavior Study Guide

Micromotives and Macrobehavior by Thomas Schelling

BOOKRAGS

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Plot Summary

The book, "Micromotives and Macrobehavior" by Thomas C. Schelling is a classic presentation of how the activities and behavior of the individual impact the larger entity; i.e., the community, the country or the world. Thomas C. Schelling is the 2005 Nobel Prize recipient for Economic Science. Schelling illustrates complicated studies in statistics in terms that the everyday person can understand and indeed relate to.

Schelling begins his narrative with a situation that everyone has encountered. As people enter an auditorium for an important lecture, they select different locations in which to sit. At first glance, one would conclude that the choices are random with no serious pre-thought expended. Digging deeper, however, Schelling shows the reader how seat selection is indeed mostly calculated. Many people will not select the first row—perhaps a throw back to their student days. That is, a psychological pull stops one from sitting in the row where the "teacher" would be sure to call on him.

First arrivals may choose to sit in the last row. The reasons behind these choices could be either to see others arrive (watching others arrive in their finery as at a wedding) or to be in positions in that last row to be able to leave first or leave before the lecture is over without embarrassing themselves. By these first arrivals taking the last row, however, their choices have a strong influence on the others arriving afterward. Some humans have a "bunching" instinct, others feel more comfortable being near others and still others do not like to mark out new territory. As a result, as the last row fills up, the most likely impact on the later arrivals is that, due to one of the reasons listed before, they will begin to sit in rows just in front of the back row. There may be some later arrivals who will strike out new territory and others who will feel comfortable following these pioneers. Once all the seating is completed, not everyone will be happy with their locations since later arrivals run out of choices. This exercise explained in everyday terms is technically termed "spatial distribution."

Schelling describes socio-economic models that reflect "critical mass" situations that mirror the cyclic behavior of population groups. For example, a critical mass model indicated the cyclic behavior of measles outbreaks in a poor African community. After children were immunized against measles, mothers would observe that the community was free of the disease. The mothers would then neglect further immunizations and as time went by there were more measles outbreaks. Once again, the mothers would have their children protected and the cycle of disease/no disease would thus perpetuate.

One of the most famous portions of Schelling's book is his discussion on integration/segregation. The immigration phenomena that falls within the "tipping" category of behavior modeling. At first a community is homogeneous in ethnicity. The starkest example in America would be the example of an all-white neighborhood that begins to slowly take on new neighbors of different ethnic background (black). There is an internal barometer that makes some people feel most comfortable surrounded by people who are like themselves. As the emerging pattern increases and sustains, some of the original neighbors (white) begin to feel uncomfortable and start to move out. As

their number decreases in the original neighborhood, more members of the new ethnic group—also feeling comfortable with others of their own ethnicity—move in. This process finally tips the neighborhood from what once considered a white community to one that is predominantly black.

"Micromotives and Macrobehavior" is literally a textbook for the methods and analysis used by social scientists in examining, monitoring and predicting the behavior of people based on reliable modeling developed from exhaustive research and statistical data making up the required propositions that underlie the process.

Chapter 1: Micromotives and Macrobehavior

Chapter 1: Micromotives and Macrobehavior Summary and Analysis

Thomas Schelling takes the reader through an extensive exercise in seat selection by audience members. He begins with a lecture he gives to an audience of 800. However, when backstage Schelling he can see the first few rows of the auditorium. The rows are empty and Schelling assumes that no one came. However, he still goes through the paces, is introduced and enters the stage. Once reaching the podium, Schelling now sees that the first 12 rows are empty but those beyond that are packed.

Schelling uses this experience which illustrates "spatial distribution" to explain on of the basics of micromotives and macrobehaviors. Some examples in this simplistic example are familiar to anyone who ever entered at lecture at an auditorium and had to decide where to sit. Although the internal process one goes through in this rather simple process are definitive and complex, generally one has participated in seat selection so often that it seems to be one that requires no thought.

However, as Schelling brings the reader through the possible subliminal motives for seat selection and how those same actions set of a sequence of behavior in others, it is apparent that seat selection is not a superficial nor thoughtless act. For example, ingrained in most people is the behavior learned as young students to "not sit in front" because the teacher would more likely call on those closest to the front. Even though a lecturer is not going to conduct a pop quiz with members of his audience, that dread is so much a part of the psyche that the first row remains "scary."

There are other hypotheses. Many people may want to sit closest to the rear. Along with the bugaboo against sitting in the front, many audience members are thinking ahead. They want to position themselves nearest the door so they can leave first. Their seat selection affects those arriving after these rear sitting people and may not want to venture from the group—since there is a bunching mentality—and of course probably do not want to sit in front. Those following may sit directly in front of those in the last row—not wanting to break new territory they follow their bunching instinct and the auditorium is filled from the rear.

Still others may want to sit in the rear for a different reason. These individuals may be people watchers. They may want to position themselves in a rear seat so that they can observe other people as they arrive—like selecting a rear seat at a wedding to watch others arrive in their finery. Another possibility follows the example of not wanting to sit in front at school. Perhaps seat selection is a learned process. "My Aunt Jenny always sits in the fourth row, second seat from the right." If pressed, Aunt Jenny probably cannot recall how she came to find this selection as preferable.

In all these scenarios, there is a pattern—each one involves preferences, goals, maximizing view or minimizing effort. It is also apparent, that one's seat selection can positively or negatively impact those who follow. This is referred to as mode of contingent behavior. For example, those forced to sit closer because the back rows are filled may be able to hear or see the stage better. On the negative side, however, someone selecting the fourth row, second seat may ruin Aunt Jenny's evening.

In nature, light travels a path and leaves and plants react to it they need for photosynthesis. Unlike plant life, however, people make decisions. When a building is burning, people make a decision to run because they know they will be burned if they do not. As opposed to light and plants, people make conscious decisions to navigate through their environment. Analyzing the behavior of human beings in their environment is a distinctive process. A social scientist can be compared more accurately to a forest ranger than to a naturalist. A naturalist may observe that a species is becoming extinct and become curious as to the cause but does not really care about its fate while a forest ranger can observe the potential extinction with a view on how to save the species.

The social science that conforms most to the "forest ranger" analysis is economics. There are billions of decisions made every day by those involved in the economy. For example, everyone from the farmer, to the taxi driver, to school teachers and soldiers all make decisions about their segment of the economy. The cow farmer does not need to know who will drink his milk or how far away that person is and what that person will ultimately pay for his milk. That farmer needs to know how much milk he produces and what he will charge for it. Those within the larger economy do not need to know how that overall economy actually works.

The economic system in most successful countries works the way an ant colonies does. Individual ants are not aware of how the overall anthill operates. A single ant does his work and reacts only to those other ants around him. He is not aware how many scout ants there are hunting for food or the number of ants rebuilding sections of the anthill after a storm. Why the colony works as well as it does is attributable to social and genetic evolution. However, the overall success of the anthill is analyzed in the aggregate and not on the basis of the individual ant's contribution.

When encountering a system that seems organized, one should not assume that it is attributable to the order of the jungle or to a forced slave system. Rather, one needs to determine the "what" those that comprise the system are doing and how it impacts the overall system. Economists tend to infer results from the characteristics of the people within the economy and those of the overall system. The phrase the "market works" is akin to the "free market" in that although every individual within that economic structure may not win, the overall economy will succeed. People and organizations may face disaster and ruin, however, that failure serves to help the overall economy succeed. Social decisions such as whether to marry and have children and personal habits such as recreational pursuits and hobbies all impact the overall system. Although in the aggregate, results are defined, most of these activities are free of standardized management. Individuals may care how about the overall affect of their behavior, however, their initial motivation stems largely from self-interest.

Equilibrium on its surface seems to indicate that something has reached a positive state. However, that is not necessarily true.Once a hanged man stops swinging, he reaches equilibrium but he is still dead. An equilibrium analysis is a tool of the economist. However, its results cannot assumed to be an expression of approval by the economist. Economics is a science unique in social phenomena. Other social systems involve people impacting other people. Where one parks depends upon where someone else parks. If one hates the traffic, he is part of it. Who one marries depends on whom one meets, their marital status and their willingness to marry. What is special in economics, however, is a system in which everyone affected is a voluntary participant resulting in individual voluntary exchanges. There is a lot to be said for this "free market" exchange system. Necessary for a successful system, is individual research and institutional arrangements designed to protect those who might be affected by the transactions.

In some cases, inadequate analysis of participants of a economic system like life insurance or health care that fails to weed out high-risk individuals will not succeed in the end. The free market may produce a distribution of income that some individuals do not like which is why such system deserves one's amazement but not necessarily one's admiration. Some economic arrangements are morphed out of necessity. An example of a "contrived market" is one created by the copyright law which prohibits others from selling something written by someone else. A "partial market" is one where intervention creates an optimal condition—a beach with limited admission keeps it from being overcrowded and thus undesirable. The housing market is responsible for providing only a tenant and landlord—not for the tenant's decision to live in the particular neighborhood. Although marriage is a partnership entered into voluntarily, in most cases, it has an enormous affect on the socio-economic makeup of the next generation.

Returning to the subject of spatial distribution, selection by individuals as to where they sit or stand and how close in proximity to others they are in social gatherings are pervasive phenomena. Age, race and sex are all potentially divisive elements. Language is an almost completely adaptive behavior dependent upon the country and the language or languages taught in school and sanctioned by governments. Words can be added to a language when it is universally deemed appropriately descriptive and fitting, "Google" as in "Google the Internet" has come to mean much more than a company name.

Chapter 2: The Inescapable Mathematics of Musical Chairs

Chapter 2: The Inescapable Mathematics of Musical Chairs Summary and Analysis

One activity that impacts others is telephoning. In the aggregate, the individual receives as many calls as he makes. However, on the individual basis, that balance, of course, does not exist. Some phone calls stimulate subsequent phone calls. Christmas cards are sometimes sent out of obligation or guilt. Some send more cards than they receive. In the aggregate the number of calls received and placed by an individual are equal. The aggregate number of bikes stolen is almost identical with that of people who have had bikes stolen—when considering such discrepancies as stolen bikes not yet reported or stolen bikes re-stolen.

Of the social sciences, economics is one in which the class of generalizations plays an important role. A bike purchased for $150 takes the $150 from the buyer but he gets the bike. The shop loses the bike but receives the $150. Although the shop bought the bike for only $90, the other $40 can be attributed to rent, insurance, salaries, etc. Therefore, the exchange is equal. In economics, these accounting statements or reconciliations are fundamental to the analysis of income and growth, money and credit, inflation and other economic drivers. Tracing the dollars down is comparable to an unending game of musical chairs.

For analysis purposes, some behaviors or propositions have the character of mathematical truisms or "identical equations." Careful attention has to be given to the "definition" of each proposition. For example, does "housing economics" for an individual include income of adult children living in the house; retirement funds of grandparents residing there; does it include the family vacation home in another location. For the proposition or behavior to be effective, the underlying definition must be inclusive and correct. Some of the most fundamental "accounting identities" in economics are not obvious at first and not even obvious when revealed. The reason for this disconnect is that these propositions do not relate to anything in the experience of most people.

When pairs are formed from complementary population segments, there are irrefutable mathematical results. Marriage for example in a natural population with similar numbers of men and women and compatible life expectancies represents an opportunity for a high incidence of marriage with equal chances for both sexes. Looking at the example of a reasonable distribution of women students among dormitories at a college where the population is 75 percent male, presents a challenge to the social scientist in attaining equitable distribution. Throwing in a measure of black students among the mainly white group deepens the complexity of arriving at a definitive proposition.

Schelling looks at the pratfalls in hypothetically raising the draft age from 19 to 20. The transition would cause issues in size of army, percentage of population drafted, training time and lengths of service. The issue is compounded when considering the number of new personnel needed to train the influx of new recruits. Issues of turnover, targeted recruitment and longevity must be considered to raise the percentage of black employees among the U.S. Postal Service. In arriving at a reliable proposition, the following variables are crucial: 1) the amount of increase; 2) the speed at which such increase is desired; and 3) the longevity or rate of turnover. This process is referred to as the "acceleration principle;" that is, when two independent activities are dependent upon each other in that one is looked to as the other's source of growth. In a simplistic way, this is seen in eating habits. Eating and body weight are each singularly interesting but how one affects the other is undeniable.

If asked, most people may suggest they are an above average driver. However, "above average driver" is subjective. Indeed, if there is a large number of bad drivers in the study—the bar to be a good driver is set very low. People have a tendency to assign themselves to what they consider favorable positions. Students do not want to be in the lower ten percent of their class. However, there will always a lower ten percent of a class—that is a fact. As in the auditorium example, everyone may want to be in the center or all may want to be in the back row—both are impossible.

The sequence of skiers riding the lift up and skiing down and then returning for another ride up is considered a "semi-closed" system. This system is one that gains or loses elements that are being tracked—but in a such a limited or manageable amount that can easily be counted. The migration of immigrants into a country is another example of a semi-closed system. The Golden Gate Bridge in San Francisco is a semi-closed system consisting of drivers going mainly one way in the morning and in the other direction in the evening. Since this is a reliable proposition, a double toll is charged one way and nothing the other way with no fear that the drivers on the whole are being cheated.

In essence, the examples illustrate the frequency—not the omnipotence—of the underlying numbers and quantities dealt with in social sciences. By using established propositions based on vast research and analysis, a discipline is applied to models that make them become more reliable. A logical classification system would be helpful to more quickly arrive at reliable propositions, but elements within any system are unique and require focused attention. In physical sciences, equivalences and invariances are called laws or principles. In economics, and other social sciences, they are referred to as market-balance equations; accounting statements; or social accounts. Demography has similar characteristics to economics in that they both depend on countable entities and measurable quantities and social activities like birth, marriage, sales and purchases.

Although there is no way to establish pre-set classifications, there are nine ways that constraining propositions function successfully.

1.A great many phenomena occur in pairs.

2.Some populations and measurable quantities are governed by a principle of conservation in a closed system.

3.Some quantities move within a semi-closed system.

4.There are behaviors that require complementary population sets.

5.There are variables that are singularly interesting but when paired with another element have definitive impact.

6.The independent variable in a behavioral system is ultimately proven to be the sum of the dependent variables.

7.The independent variable sometimes proves to be the average or other distinct result of the behavior they impact.

8.Sometimes two different variables have a common component.

9.The "exhaustive subdivision", that is the myriad of potential results, should be listed.

Chapter 3: Thermostats, Lemons, and Other Families of Models

Chapter 3: Thermostats, Lemons, and Other Families of Models Summary and Analysis

The heating/cooling system that includes a thermostat has a process that mirrors the model of many behavior systems. It is illustrative of a cyclical process that generates alternating ups and downs. The process contains mechanisms that cause a rising variable to under perform and then over perform. It is designed to "seek" the appropriate level. Applying this model to human behavior, a scientist who managed a measle-vaccine program in a poor country found that once the vaccine had suppressed the disease that mothers would stop having infants vaccinated. The disease would then reappear and would once again be defeated by the inoculations only to rise again when mothers determined the disease was wiped out.

The thermostat model reminds one to expect a lag time in other cyclic processes. When the temperature drops below that set on the thermostat, there is lag time before the system is kicked on. Similarly, there are numerous social phenomena that react with a lag time. When the Russians successfully launched Sputnik, the US was gripped with fear that it lacked the necessary engineers and scientists to compete in the space race (undershoot). Much recruitment was undertaken resulting in a new crop of US scientists but the process took several years (lag time) to become robust. When the space program slowed, there were more scientists than was needed (overshoot). Subsequently, some scientists and engineers were laid off—the system was "seeking" its equilibrium.

A social behavior model can be either a precise and economical statement of a set of relationships or an actual biological, mechanical or social system that embodies the relationships. Creating a algebraic formula based on the thermostat—replacing "water temp," "on" and "off" with x, y and z creates a mathematical description that can be successfully applied to behavioral systems that fit the cyclic model of the thermostat. The math will describe physical and mechanical systems as well as social phenomena, animal behavior as well as human, scientific principles down to details such as household activities. An example of this type of "critical mass" modeling is an atomic pile that is in immediate need of a given fissionable material necessary in order to sustain a chain reaction's constancy.

There are a series of families of models that are utilized by social scientists. They have counterparts in other sciences and are not stand-alone theorems. Rather, they are models of recurrent behavior that are enhanced with the help of more familiar models. Models overlap—the measles epidemic is a critical mass process. Social behavior considered "critical mass" is one in which the number of people exhibiting a behavior is the most important driver. Examples are one person smokes in a no-smoking area and

gets away with it—others light up. A number of people cross the street against the light—others finally venture out deciding against waiting for the light to change. What critical mass models involve is an activity that is self-sustaining once it passes a specific minimum. Once 10 people cross against the light, others observe that it must be safe to cross.

In one critical mass model, decisions are based on actual numbers—drawn to the majority, or following the herd. Choices are continuous and reversible. A person can decide to wait on the corner by himself for the walk light instead of crossing with the other pedestrians. On the contrary, he can continue to follow the lead of the large group of pedestrians who cross illegally. The tipping point or critical mass is subjective. One person may cross illegally when two others go ahead of him. Another person's critical mass may lead him across the street when he has the relative safety of following 10 others.

There is a critical mass model named the "lemons model." The name is derived from cars that turn out to be clunkers (lemons). This model consists of a cycle wherein a reluctant buyer is afraid of purchasing a car which turns out to be a lemon. This fear of purchasing drives down the price of all cars, including good cars. The owners of good cars do not feel they are receiving appropriate amounts for their cars, so they in turn keep them out of the mix. Once buyers are presented with only lemons, the market dries up. This model is a case where one side of the equation has more information about the process than the other. The "tipping" critical mass model was a name first applied to neighborhood migration. As a former homogeneous neighborhood becomes changed with the influx of a new ethnic group, members of the former group begin to leave thus allowing more room for more members of the new group. At one point, the make-up of the neighborhood will tip over to the new ethnicity.

Schelling illustrates critical mass models in diagrams based on attendance at meetings—some who will always attend, some who will rarely attend and a majority who will attend but only if enough people attend. Defining "enough" is the key and it is a subjective matter. However, once learning that number and establishing other elements, the diagram illustrates frequency distribution that is converted to a cumulative form. The cumulative curve begins on the vertical axis denoting those who will attend no matter if others do not, rises to those who will attend only if the number attending meet their threshold and crests at the point that includes everyone except those who will never attend. Once a reliable model is established, it can be used for a myriad of other purposes even one involving the entire population of a country.

Garrett Hardin's book "The Tragedy of the Commons" has catapulted the word "commons" into the same category as "multiplier," "noise," "zero-sum," "critical-mass," and "bandwagon." Many years ago, the term "prisoner's dilemma" meant a commonly occurring situation between two individuals, one in which two people hurt each other more than the help themselves in making self-serving choices. Hardin's "commons" reference is in that genre but refers to multi-person structures. The "commons" serves as a paradigm for situations in which people so intent on their own goals encroach on

the efforts of others. These people might be better off somewhat restrained, however, no one gains individually when artificially restrained.

Hardin bases his research on common grazing areas in England where there was no limit as to the number of cows allowed in to graze. Not surprisingly, soon there was not enough forage to handle the number of hungry grazers that were allowed in. The malnutrition the cows suffer would be reflected in their inability to produce milk. The unhealthy cows would produce much less milk, thus affecting the ability of the farmer to make money and thus having a negative effect on the overall economy. Familiar commons models include pollution, noise, litter and others—all things that people do not notice at least at first but that definitely have a lasting effect on their lives. "Looser" definitions of the commons model include hoarding library books; hogging pay phones; and, sitting through intermissions to maintain seating.

Self-fulfilling prophecy is a familiar term to most people. This social model is explained as one wherein certain expectations are of such a nature that they are induced by other who expect these specific behaviors. This behavior is designed to produce less than positive results. For example, if a certain ethnic segment is expected to be unable to hold a responsible position, they will not be hired for responsible positions and thus never get the opportunity to learn the jobs and thus live up to their reputations.

In a broader sense that does not involve discrimination, a self-fulfilling prophecy can be produced. If there is a rumor that a coffee shortage is about to occur, if people begin to buy up all the coffee on the shelves in advance—a shortage has thus been created. There is also a behavior known as a self-displacing prophecy. An example of this is tipping a waiter. Perhaps a person wants to tip the waiter above the "average." That will work unless everyone decides to tip above the "average" because that average will be elevated or displaced by this behavior. Self-enforcing conventions include "No Parking" signs, speed limit signs or "No Smoking" areas. When daylight savings time begins, it is a self-enforced agreement to change one's clock. Nothing forces the changing of the clock—except the knowledge that one will be an hour behind everyone else.

Looking at the "social contract" one finds the need for society to consist of certain institutional arrangements to overcome divergences between perceived individual interest and some larger collective purpose. Some of these examples are ownership, contracts, damage suits, patents and copyrights. This proposition calls for the collective and shared purpose for a beneficial result for all. Banning litter, water conservation, passing laws banning leaf burning, disallowing trashcans to remain in front of homes are all things that most people would agree are beneficial and are behaviors that most will follow without outside enforcement.

Chapter 4: Sorting and Mixing: Race and Sex

Chapter 4: Sorting and Mixing: Race and Sex Summary and Analysis

People are segregated in many ways—by sex, age, income, language, religion, color, and other elements. Some segregation is deliberate and mean-spirited and some is by circumstance and choice. If blacks are excluded from white churches or vice versa it may be reciprocal behavior. There are reasons beyond discrimination that could drive such segregation. A church bulletin may advertise a room for rent. A black person might feel more comfortable if that ad is from a black organization. The same is true for a white person.

Discrimination in and of itself is not necessarily negative or malicious. Rather, it is a process that involves a conscious awareness of choice. For example, one would use knowledge and awareness to shop at a grocery store that has fresh food. That is being discriminating. However, discrimination because of ethnicity is often based on false perceptions that can lead to harmful segregation. The analysis for determining discrimination is abstract and can provide an interpretation for any two-fold distinction—whites and blacks; boys and girls; officers and enlisted men; students and professors. It is difficult to draw the line that separates "individually motivated" segregation from that which is organized institutionally or that is economically induced.

Individual incentives and collective results as they relate to segregation are elements with which social scientists must consider in behavior modeling. Doubt arises over the social efficiency if aggregate segregation is due to a thin range of electives. A demography of any American city will quickly illustrate black versus white areas. Quantitative analysis supplies a few logical constraints. If both the black and white sectors insist on being a majority in a community, there is only one way to reach amity and that is to work for complete segregation. To understand what segregation may result from choice, one must know the incentives that motivate the behavior.

The processes of separation, segregation, sharing, and mixing have in common—consequences are aggregate but the decisions that produced them are highly individual. The aggregate results, of course, do nothing in revealing those individual selections. The underlying motivation behind segregation can be far less extreme than what is superficially observable. In the "bounded-neighborhood" model, residents are happy to be in their neighborhood as long as residents of the opposite color do not outnumber them. "Tolerance" is subjective, but when one's personal limit is exceeded, he will move to an area that will provide him with more comfort.

An example of tolerance depicts a neighborhood where all whites are content thus encouraging other whites to enter. However, if not all whites are content, some will leave

—and leave in the order of their discontent. Those who remain are deemed to be most tolerant. The same is true for blacks in a mixed community. Schelling depicts graphics that illustrate the median number of ethnic members tolerable by the other ethnic group —the goal ultimately is arriving at an acceptable equilibria between the two. However, this is not always possible and there are alternate equilibria available to consider. The model does not allow for speculative behavior, organized action, (i.e., forced integration) or time lapses.

Chapter 5: Sorting and Mixing: Age and Income

Chapter 5: Sorting and Mixing: Age and Income Summary and Analysis

There are idealized models of segregation and integration. The importance of these models lays in their ability to identify an important social phenomenon and secondly in results that have gravitas. Of course models consider variables. Discrete variables are social issues such as sex, race and religion. Continuous variables are things such as age, income and IQ. In addition to population concerns, the model is designed to identify activity. There are also constraining mathematical identities that cannot be ignored. For example, the youngest 10 percent move out of an apartment building because they do not want to live with older people. The remaining population of the apartment, however, now has a new "youngest 10 percent." The average age of the youngest 10 percent may have changed but what does not change is that there will always be a youngest 10 percent of the population—unless everyone is exactly the same age.

The "open model" represents an even distribution of ages with a distinct median age. If that median age is 45, the model may reflect that everyone under 35 will move out as will everyone over 65. In a "closed model" there are more considerations to address than just age. Additionally, alternate preferences can be included in closed models. An equilibrium division of the population will not generally produce optimal results. Rather an imposed division will satisfy some participants, disappoint others who are willing to accept their position and still others who are disappointed and who will change their position if possible.

The optimum use of the these sorting and mixing models is for residence or membership purposes. Enhancements can be made to the models for customization purposes. For example, an element such as "density" could be added to a "closed model" to allow for improved distribution of the population group. A specific application of such a model is a distribution for a residential home for the elderly. In this case, the model can take into account age, income, marital status, health and other concerns. Another use for this type of model is aggregate results for prospective college students. The model can consider a wide range of elements including scholarship potential, rank of school, athletic programs, size of school population, dormitory offerings, etc. The simplest model contains population numbers to which each person relates, an individual preference about the statistic and understanding that one is part of the process, a contributing factor.

There are driving factors in population preferences that have more to do with the individual than it does with liking or disliking those who wind up in their group. While schools can logically segregate students by age, once reaching adulthood there are

many more considerations about where and with whom one chooses to spend his time. For example, a family with young children will want to live in a neighborhood with young families. Relations between the adults—the other parents close to their own age—are a matter of circumstance rather than choice. People who hate dogs may choose not to be around dog-lovers but that does not mean they hate the dog-lovers themselves.

Chapter 6: Choosing Our Children's Genes

Chapter 6: Choosing Our Children's Genes Summary and Analysis

When a man and a woman have a child, the potential number of genetically different offspring is vast. There are approximately 8 million distinct sperm a man can produce and about the same number of eggs from a woman. Multiplying these together, one can understand the enormous possibilities. No matter what, the children a couple will have will probably look like the mother or father and have similar characteristics of their parents. What if parents could help "design" their own children? If parents were able to opt for the sex of their child through chromosome selection, what would be the social ramifications? There would be positives and negatives. Families may become smaller in some societies. Couples that now have four children—three boys and then finally the girl—could stop at two if they were able to select a girl baby as their second.

In some cultures, boys are preferred. If the ratio of boy births vs. girl births is lopsided toward the males, as these babies mature there would be a stark shortage of potential wives for the grown men. In this case, monogamous marriage could be at risk. Would such an imbalance cause consternation to the government? To remedy a population imbalance among the sexes, the government might offer tax incentives for couples to have the sex that is becoming a minority. Talk about the nanny state! Like the weather, choosing the sex of one's child might be better left to nature.

What about other characteristics being made choices for prospective parents: size; longevity; left vs. right/handedness; eyesight; athletic ability; IQ, others? Longevity and size are continuous variables while left vs. right/handedness is a discrete variable. Perhaps more in-depth chromosome mining could accomplish detailed data to eliminate "undesirable" traits. Such customization of a child's characteristics would result in some demographic consequences. If every couple were able to choose a "large boy" then the median size of boys would be forever affected. Culturally there could be negative result if most parents would choose right-handedness. That random child not genetically engineered born left-handed might be living with a stigma.

Eugenics selects parents versus genetically engineering in which process parents would conceivably "build" their child. Eugenics is the traditional method where one's only decision is an easy "yes" or "no." This futuristic chromosomal selection would interfere in one of the most basic rights a person has. However, a more benign chromosomal selection process could be beneficial in that it could serve to screen out serious pathologies. Although selecting for a higher IQ would be beneficial for one's child, there is a down side. Parents who would not otherwise go the chromosomal selection route may feel pressured to do so to keep their child competitive. Again, the overall IQ range would ultimately yield a new, higher average. Where would it end?

Chapter 7: Hockey Helmets, Daylight Saving, and Other Binary Choices

Chapter 7: Hockey Helmets, Daylight Saving, and Other Binary Choices Summary and Analysis

Binary choices with externalities—either/or situations are something with which everyone is confronted at one time or another. An "externality" enters into the fray when the thoughts or behavior of another person affects what another person chooses to do. For example, after a famous professional hockey player has a hockey stick driven through his skull to his brain, other players contemplate whether they should begin wearing helmets. The general feeling is that although the players know it is safer to wear helmets, their vanity will prevent them from doing so. The players feel that they risk being ridiculed for being weak or unmanly if they would begin wearing helmets. However, it is a general consensus that the players would all be glad if the league made wearing helmets mandatory. (Obviously, this was written before helmets were mandatory.)

In the hockey helmet case, the major consideration is not the reasonableness of the concern but rather how many will make the choice. Sometimes one can gather just through personal observation the "choice" of the majority. For example, one can look around in a snowy parking lot and determine how many people have snow tires. A man can tell how to dress at the office by observing his male co-workers. In other cases, the answers are not apparent at all. One cannot know who has been vaccinated against a disease without asking around. Going along with the group (joining a self-restraining coalition) or staying out and doing one's own thing is a binary choice. Most often there is more involved in this decision-making process than being with the majority. In the case of vaccinations, a parent is more concerned with the benefits and safety of the inoculation as opposed to the sheer number of other parents who are choosing to vaccinate their children.

In a binary choice of two or more persons there are two preferences. An unconditional preference is a person's choice that remains constant regardless of what the others opt; unconditional preference with respect to all others is a choice that remains the same regardless of what the one person opts to do. In charting binary choice schematics, the researcher finds himself with many possibilities though not an infinite amount. It is starkly apparent how important the underlying elements, or propositions, are and how crucial that this input is reliable. As in all models, the the goal of the binary choice model is to reach a result or an "equilibrium" or at least a "potential equilibrium."

Chapter 8: An Astonishing Sixty Years: The Legacy of Hiroshima

Chapter 8: An Astonishing Sixty Years: The Legacy of Hiroshima Summary and Analysis

This chapter is a departure from the rest of the book. It is Dr. Schelling's Nobel lecture. In his lecture, Schelling lauds the lapse of time that has gone by without a country attacking another with nuclear weapons. Schelling speaks in fearful yet awe-inspiring terms of the power of the nuclear weapon. He covers a history of the weapons and the changing reactions and thoughts of society regarding these destructive entities that share the planet with its vulnerable population. Schelling takes the reader (listener) through some of the circumstances surrounding President Truman's decision to use the bomb. The British pleaded with the US President not to use the weapon but of course that appeal of course failed.

Schelling then takes the reader through the thoughtful approached taken by Truman's successor, President Eisenhower. Although Eisenhower did not opt to use them in the Korean War, during his administration nuclear weapons were elevated to "conventional weaponry" status. However, during the Kennedy-Johnson years, the weapons were once again relegated to non-conventional. Schelling points out that the benefit of arms control, limiting nuclear weaponry in favor of non-nuclear capability, is a self-fulfilling prophecy. This ideology echoes Schelling's behavior modeling of the herding instinct—once the majority leads others will usually follow. President Bush (41) was not forced to use nuclear weapons against Iraq since the US forces so easily ran Saddam out of Kuwait.

Schelling ends his remarks with the hope that the US will be able to suspend its dependence on advertising its nuclear strength let alone ever having to use them again. Nuclear powers need to weigh their use and proliferation against a universal abhorrence to them not to mention the horror and destruction they can level against humankind.

Characters

Thomas C. Schelling

Thomas C. Schelling is the author of "Micromotives and Macrobehaviors" which is a classic presentation of how the activities and behavior of the individual impact the larger entity; i.e., the community, the country or the world. Thomas C. Schelling is the 2005 Nobel Prize recipient for Economic Science. Schelling discusses this award indicating that this book was not specifically sited as contributing to his receiving the award. However, the Nobel committee did site that Schelling was awarded the prize "for having enhanced our understanding of conflict and cooperation through game-theoretic analysis." Schelling defines "game-theory" as the study of how rational human beings choose the best of two or more options, when the best choices depend upon choices others will make.

Writing an updated introduction in 2006, Schelling refers to the substance of his work occurring some thirty years before that. He explains that In "Micromotives and Macrobehaviors" was not originally conceived as a book. However, through his years of work he ultimately realized that he had the material that fit naturally together in one document.

Schelling attended UC Berkeley for undergraduate studies in economics. He received his PhD in Economics from Harvard. Schelling is also the author of "The Strategy of Conflict, Choice and Consequence" and "Arts and Influence." Schelling spent many years at Harvard University in both the Department of Economics and the Center for International Affairs. Schelling has also conducted some advisory work for the Federal government. He is a Distinguished University Professor of Economics and Public Policy at the University of Maryland. Schelling's "Micromotives and Macrobehaviors" has long been considered a classic reference, greatly influencing many in the economics community.

In "Micromotives and Macrobehaviors," Schelling illustrates complicated studies in statistics and mathematics in terms that the everyday person can understand and indeed relate to. Schelling is kind to the reader in that he simplifies the very technical, statistical research and results into understandable terms that the layman can easily understand. For example, Schelling begins his narrative with an example that everyone has encountered at one time or another. As people enter an auditorium for an important lecture, they select different locations in which to sit. At first glance, one would conclude that the choices are random with no serious pre-thought expended. Digging deeper, however, Schelling shows the reader how seat selection is indeed mostly calculated and has importance as a model in human behavior.

One of Schelling's most referenced work in this book centers around his discussion and research on integration and segregation. He illustrates that innate human preference rather than malicious racial bigotry is oftentimes behind a neighborhood that changes

from one ethnicity to another, eventually though unintentionally leading to segregated populations.

Human Beings

Many of Thomas Schelling's socio-economic behavioral studies of course use human example. The very first example is one that everyone has encountered. As people enter an auditorium for an important lecture, they select different locations in which to sit. At first glance, one would conclude that the choices are random with no serious pre-thought expended. Digging deeper, however, Schelling shows the reader how seat selection is indeed mostly calculated. Many people will not select the first row—perhaps a throw back to their student days. That is, a psychological pull stops one from sitting in the row where the "teacher" would be sure to call on him.

In nature, light travels a path and leaves and plants react to the sun that is vital for photosynthesis. Human beings however make decisions. People run from a burning building, making the decision to run because they know the consequences if they do not flee. As opposed to light and plants, people make conscious decisions to navigate through their environment. Analyzing the behavior of human beings in their environment is a distinctive process. There are millions upon millions of decisions made every day by those involved in the economy. Everyone from the farmer, to the construction worker, to police and nurses all make decisions about the economy within their segment of the community. The cow farmer does not need to know who will drink his cow's milk or how far away that person is and what that person will ultimately pay for his milk. What that farmer focuses on within his relatively narrow sphere is how much milk he produces and what he will charge for it. People within their portion of the economy do not need to know how the larger, overall economy actually works. However, they do their part in making that economy a viable, functioning entity.

In the study of human behavioral trends, Schelling pays much attention to marriage and divorce. In this study, he looks at the ages of men who marry and that of women who marry. His statistical research shows him that if women generally marry at a younger age than men, which is true in the United States, that women in general will experience a longer widow-hood in their declining years. The phenomenon, thus, of the largest numbers of available single men versus that of available single women at any one given time leaves two disparate groups whose ages are not typically compatible to marriage—single men with an average age of 25 and women with a much older average due to becoming single again in later life.

The integration phenomena falls within the "tipping" category of behavior modeling. At first a community is homogeneous in ethnicity. The starkest example in America would be the example of an all-white neighborhood that begins to slowly take on new neighbors of different ethnic background (black). There is an internal barometer that makes some people feel most comfortable surrounded by people who are like themselves. As the emerging pattern increases and sustains, some of the original neighbors (white) begin to feel uncomfortable and start to move out. As their number decreases in the original neighborhood, more members of the new ethnic group—also

feeling comfortable with others of their own ethnicity—move in. This process finally tips the neighborhood from what once considered a white community to one that is predominantly black.

Adam Smith, two-hundred years before, characterized the perfect economic system as one that worked as if some unseen hand brought about the coordination.

Kenneth Boulding is known for using ecological behavior models to study group conflict.

Maurice S. Bartlett in "Epidemics" in Statistics: A Guide to the Unknown, presents a model for the study of the measles epidemic and results by country.

J. Maynard Smith, Models in Ecology, chapter five, "Competition" is referenced in the study of group conflict.

Harvard Faculty

A common occurrence among the Harvard faculty is the "dying seminar." Much enthusiasm exists when a group is organized to pursue some common interest. People begin to drop off and thus causes the demise of the seminar.

George A. Akerlof, "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism," is referenced in Schelling's discussion of critical mass modeling.

Garrett Hardin's book "The Tragedy of the Commons" is referenced in Schelling's discussion of critical mass modeling.

Mothers and Children of African Village

A behavioral study was made of children inoculated against measles in an African village. As time goes on, the mothers observe no new outbreaks of the disease, so they stop having their infants inoculated against measles. More time elapses and the mothers begin to see a recurrence of the disease and once again begin having their children protected.

Julius Margolis is a colleague who inspired Schelling. Margolis urged Schelling to lecture on a collection of thoughts and ideas that Schelling was working on. This collection later emerged as the Fels Lectures.

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Objects/Places

Urban Areas

Much of the research behind Schelling's socio-economic behavior modeling is based on large population centers in the US.

Countries of the World

The behavior models established by Schelling and other economists are used to establish socio-economic patterns in all countries of the world.

Economics

Economics is the science for which Schelling received his Nobel Award and it is the basis of much of his book. Economics is a science that focuses on the production, distribution, and consumption of goods and services and how this process affects man.

Social Sciences

Schelling is a Social Scientist in the field of Economics. Modeling from other social sciences are used in developing economics modeling.

Propositions

Propositions are required part of a behavior model. They are well-defined descriptions upon which behavior models are based. Propositions are exhaustively researched for their reliability to ensure that results of the modeling can be trusted.

Thermostat

The heating/cooling system that includes the thermostat is a model of many behavior systems.

Free Market

A "free market" is one in which regulation is virtually non-existent. A purely free market is established solely by its buyers and sellers.

Semi-Closed System

A semi-closed system is one that gains or loses elements that are being tracked—but in a limited or manageable amount that can easily be counted. The San Francisco Golden Gate Bridge is an example of a "semi-closed system."

Spatial Distribution

The preference or selection of residence of a population within a community or country; the choice of a seat in a theater.

Commons Modeling

The "commons" behavior model was developed from an old adage where a common grazing area allowed in an unlimited number of cows to graze. However, ultimately the field was over-used and some cows became malnourished and began producing less milk—causing the cow farmer to make less money.

Themes

Behavior Modeling

Thomas C. Schelling's "Micromotives and Macrobehavior" provides material that Social Scientists like Schelling use in developing their theories and conclusions about socio-economic behavior demonstrated by people in communities and countries. Schelling describes socio-economic models that reflect "critical mass" situations which illustrate the cyclic behavior of population groups. For example, a critical mass model had been developed to capture the cyclic behavior of measles outbreaks in a poverty-stricken African community. After children were immunized against measles, mothers felt the risk had disappeared since there was no sign of the disease. The mothers would then neglect further immunizations allowing the disease within a short time to return. Once again, the mothers would have their children protected and the cycle of disease/no disease would thus continue.

One of the most famous portions of Schelling's book is his discussion on immigration. The immigration phenomena that falls within the "tipping" category of behavior modeling. Other types of behavior modeling Schelling describes include "lemons" and "commons." Lemons modeling is named for new cars that turn out to be a bad buy (lemons). Commons modeling is based on an old adage where cows are allowed to graze freely in a common area finally destroying the grass from over use. The undernourished cows stop producing milk and bring financial ruin to the dairy farmer.

Economics

The book, "Micromotives and Macrobehavior" by Thomas C. Schelling is a classic presentation of how the activities and behavior of the individual impact the larger entity; i.e., the community, the country or the world. The major thrust of Schelling's research is the socio-economic impact of human behavior. Thomas C. Schelling is the 2005 Nobel Prize recipient for Economic Science. Schelling was also a Economics professor at Harvard and several other universities. He was also called upon by the US government in an advisory capacity due to his expertise in economics and its impact upon society.

The social scientist conducts his analysis of economic concerns with a view toward improving the economic outlook for society at large. There are millions and millions of decisions made daily by those involved in the economy. For example, everyone from the nurse, to the plumber, to school teachers and firemen all make decisions about their segment of the economy—not giving a thought as to how it may affect the overall economy. The cow farmer does not need to know who will drink their milk or how far away that person is and what that person will ultimately pay for his milk. That farmer needs to know how much milk he produces and what he will charge for it. Those within the larger economy do not need to know how that overall economy actually works. Dr.

Schelling makes it clear that this larger economy is what the social scientists focus upon.

Mathematics

Schelling, as all social scientists, relies heavily in mathematics and statistics in his scientific research into human behavioral patterns. As an example, some behaviors or propositions have the character of mathematical truisms or "identical equations." Careful attention has to be given to the "definition" of each proposition. Applying said mathematical truisms to these important propositions provide an extra layer of reliability. Illustrating this point, when pairs are formed from complementary population segments, there are irrefutable mathematical results. Marriage for example in a natural population with similar numbers of men and women and compatible life expectancies represents an opportunity for a high incidence of marriage with equal chances for both sexes.

Schelling provides charts illustrating critical-mass models based on algebraic formulas. He uses the diagrams to provide visual evidence cumulative data and aggregate results. Developing basic algebraic formula allows Schelling and social scientists to experiment with different ratios and numbers of population and other socio-economic elements in search of stable equilibrium in their final theories.

In his research on integration and segregation, Schelling relies on diagrams that deal with "tolerance distributions" ultimately finding stable equilibria and median results. In mixed communities, numbers of each race and therefore the ratios of black to whites are necessary to properly research integration and segregation concerns and develop beneficial theories that are beneficial to society.

Style

Perspective

The book, "Micromotives and Macrobehavior" by Thomas C. Schelling is a classic presentation of how the activities and behavior of the individual impact the larger entity; i.e., the community, the country or the world. Thomas C. Schelling is the 2005 Nobel Prize recipient for Economic Science. Schelling writes with the authority of the scholar and scientist that he is. However, he takes care in illustrating complicated statistical studies and formulas and in describing the history of the development of behavior modeling in terms that the everyday person can understand and indeed relate to. In this tome, Schelling underscores his teaching credentials offering quite an education in socio-economics.

Without question, Schelling is THE expert in the field of economics and behavioral sciences. His credentials more than back this up. Beyond his Nobel Award in Economic Science, has a stellar background in his field starting with his undergraduate studies in economics at UC Berkeley. He received his PhD in Economics from Harvard. Schelling is also the author of "The Strategy of Conflict, Choice and Consequence" and "Arts and Influence." Schelling spent many years as a Professor at Harvard University in both the Department of Economics and the Center for International Affairs. Schelling has also conducted some advisory work for the Federal government. Dr. Schelling is a Distinguished University Professor of Economics and Public Policy at the University of Maryland.

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Tone

Schelling's overall tone in "Micromotives and Macrobehavior" is one of the expert clinician and teacher. The author treats the material with an understated reverence. Although the information is "old news" to him, he presents the information in a way that is fresh and respectful. The many behavior models described in the book that are old friends to Schelling are presented with a measure of newness that belies the author's high regard for his field.

Schelling is very attuned to his audience. He is well-aware that virtually no one reading his book has a background similar to himself; that is, the one he enjoys as Nobel Laurette and Economics professor extraordinaire. With that in mind, he manages to adequately simplify the extremely technical and complicated research and results into understandable terms that the layman can easily grasp. The simplification of the material along with Schelling's soothing tone in relating the data and case studies compels the reader to not only grasp it but go a step further and apply it to one's own life.

For example, Schelling begins his narrative with an example that everyone has encountered at one time or another. As people enter an auditorium for an important lecture, they select different locations in which to sit. At first glance, one would conclude that the choices are random with no serious pre-thought expended. Digging deeper, however, Schelling shows the reader how seat selection is indeed mostly calculated and has importance as a model in human behavior. The next time the reader takes a seat at a lecture it will be unavoidable for him to not think of Dr. Schelling's example.

Structure

"Micromotives and Macrobehavior" is presented in a manner that educates the reader beginning with relatively simple descriptions and analysis, readying him for more complex material as he graduates to more difficult presentations. The book was originally penned in 1978 by Thomas Schelling. In his introduction to "Micromotives and Macrobehavior," Schelling structures the first chapter, Micromotives and Macrobehavior as not only an introduction to socio-economics and modeling but as a summary of the rest of the book. The book is segmented in seven chapters. Chapter Two, The Inescapable Mathematics of Musical Chairs, examines a special class of pattern behaviors. These are patterns that arrive at aggregate results regardless of the behavior of the individual.

Chapter Three, Thermostats, Lemons, and Other Families of Models, looks at common models of behavior specifically favored by social scientists for in-depth analysis and understanding. Chapter 4, Sorting and Mixing: Race and Sex, and Chapter 5, Sorting and Mixing: Age and Income, delve into the topics of segregation and integration. Chapter 6, Choosing Our Children's Genes, looks at choices not yet available. The last chapter, Chapter 7, Hockey Helmets, Daylight Saving, and other Binary Choices, summarizes how results of the modeling process can result in the building of formal theories.

Dr. Schelling ends his book with a reprint of his Nobel lecture entitled "An Astonishing Sixty Years: the Legacy of Hiroshima."

Quotes

"In economics it often appears that a lot of this unmanaged and unguided individual activity leads to aggregate results that are not too bad, indeed about as good as could be expected if somebody took command and figured out what ought to be done and had a way to get everybody to do what he was supposed to do." Page 22.

"'Market' is meant as the entire complex of institutions within which people buy and sell and hire and are hired and borrow and lend and trade and contract and shop around to find bargains." Page 23.

"What the market is often so good at doing is only part of what happens in the market. While coordinating activities efficiently, the market may produce a distribution of income that you and I do not like, either in general, or just because of where it leaves us. This is why I invited only your amazement, not your admiration, of what the market can perform (or, even if your admiration, not necessarily your unqualified approval)." Page 31.

"Of the social sciences, economics is one in which this class of generalizations plays a central role. The reason is easy to see: economics is mainly concerned with exchanges of equivalent values." Page 49.

"What all of the critical-mass models involve is some activity that is self-sustaining once the measure of that activity passes a certain minimum level." Page 95.

"The lemons model is not only about a special kind of interdependent behavior, but has a name that illustrates it. The name is not an ancient idea or institution. . .[and] it is not borrowed from nuclear physics or ecology. . . .Nor did it just emerge through a consensual process of obscure origin. The name was picked by an economist because the 'market for lemons' has interesting properties that can give insight into a variety of situations. And the lemons . . .are not the ones from which lemonade is made, but the kind that people drive." page 99.

"[The term] 'prisoner's dilemma. . .became shorthand for a commonly occurring situation between two individuals, the one in which two people hurt each other more than they help themselves in making self-serving choices and could both be better off if obliged to choose the opposite." Page 110.

"There is a unilateral process of believing something about people, behaving toward them in accordance with those beliefs, and causing the beliefs to be confirmed." Page 116.

"The main concern is segregation by "color" in the United States. The analysis, though, is so abstract that any twofold distinction could constitute an interpretation—whites and blacks, boys and girls, officers and enlisted men, students and faculty. The only requirement of the analysis is that the distinction be twofold, exhaustive, and recognizable." Page 138.

"For those who deplore segregation, however,and especially for those who deplore more segregation than people were seeking when they collectively segregated themselves, there may be a note of hope. The underlying motivation can be far less extreme than the observable patterns of separation." Page 154.

"If most parents for several generations tried to have children just a little larger than most other people, we'd eventually get rather big—'we' the human race, not we the twentieth-century parents. And what the world is going to need in the future is smaller people, not larger." Page 204.

"Joining a self-restraining coalition, or staying out and doing what's done naturally, is a binary choice. If we contemplate all the restraints that a coalition might impose, the problem is multifarious; but if the coalition is there, and its rules have been adopted, the choice to join or not to join is binary. Page 214.

Topics for Discussion

What is spatial distribution? Describe Schelling's illustration of this phenomenon.

Describe how the thermostat is a model for some social behaviors. Give specific examples and descriptions of these systems.

There is a behavior study referenced as "lemons" modeling. Describe how this modeling got its name and the type of behaviors it focuses on. What are some behaviors this model could identify?

There is a modeling referred to as "commons." How did this process get its name? Describe the specific example that it is based on. To what type of behavior could a "commons" modeling be applied?

Define Schelling's use of the term "tolerance" when discussing segregation in a neighborhood. Provide an example of an individual who would be considered "most tolerant." Give a specific scenario.

Schelling presents a futuristic presentation of chromosomal selection. Describe what characteristics he suggests could be possible for parents in the future "design" of their own babies. What are the benefits and downsides of such a process?

Describe what a binary-choice model is. What is an "externality" and how does it relate to the binary choice model?