Ethnography and Agent Based Models

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Abstract

Ethnography and Agent based models (ABM) have a strong link in methodological and theoretical terms. ABM can be used to validate ethnographical data but also to cast fieldwork, to test some hypothesis and then return with new questions. At the end, ethnography can be seen as a nonlinear dynamic system (Agar, 2004). In the project we present here, we are working on food pattern consumption among university students in the Universidad de Lanús. One of our aims is to promote healthy pathways so we are conducting ethnographic research in order to discover new insights and using that insights to build an ABM.

Introduction

We present here a research project about food pattern consumption among people who attend to Universidad de Lanús in Argentina. The Universidad de Lanús has a great bond with surrounding community, ranging from kindergarten to activities oriented to retired people, in addition, of course, to students, professors and administrative staff. They, all together, spend a lot of time in the campus, so, in a sense, they must to solve food problem everyday and more than once in a day. Campus is big enough to make hard to reach food stores outside; more chances are to rely on food supply inside.

Overweight and obesity are today a big problem in public health. Their rate are growing fast in the last years all over the world (WHO). According to WHO, the determinants of health includes social and economic environment, among others. Overweight and obesity are factors that contribute to high blood pressure, cardiovascular disease, diabetes, etc. All these are non transmissible diseases, and they are very dependent on those determinants. Lack of physical activity and everyday meals high in sugar and fat (even worse, ultra processed food) are the main contributors to overweight and obesity (WHO).

We are conducting a research project to search for behaviours related to food consumption and physical activity in the University campus. This project is a multidisciplinary one, with

anthropologist, biochemist, nutritionist and medical doctors. Because of its nature, the project is a methodological mix, ranging from food laboratory analysis to ethnography. We are working with food samples to analyse their micronutrients, measuring weight, height and body mass index of differents actors attending University, and searching for food consumption pattern from a qualitative point of view. The challenge is to put all these data in a coherent framework, not just adding the information as an isolated themes. To achieve that goal we need to use a kind of language that can be shareable among all differents researches. And this imply to learn some of the other researchers skills, in order to understand theory and methods. But this does not means that we must become medical if we are anthropologist or biochemist become nutritionist; on the contrary this means we must to learn about others work, but keeping our specificity.

Our main hypothesis indicate that overweight and obesity are, at least in part, a consequence of food supply (high in fat and sugar) and a lack of physical activity. People in University have two ways to get the food: bring it from home or buy it at stores inside campus. Although the campus is big enough to walk around and to do some physical activity, we suspect that it is reduced to a minimum due to different factors. Despite the fact that different groups of people (students, staff, etc.) may have different rates of physical activities and consume different kinds of food. Of course, we support the idea that overweight and obesity, lead to non transmissible disease, like high blood pressure, diabetes, cancer, stroke and chronic lung disease, among others. And we think that there is a big chance to gain weight by the time the individual start to study in the university, because growth stops at 20 or 21 years (when people start their superior studies) and metabolism change (decrease) at 25 years (Bogin, 1999).

The aim of this text is not to write about the whole project, but a specific methodological issue, relating ethnography and agent based models. Ethnography was first developed by early anthropologist (at the end of nineteenth century and the beginning of twentieth century), who face fieldwork without formal or even reliable data about non western people. Ethnography lies in differences, face to face chats and participant observation. It is the opposite of statistics, because statistics emphasize in summaries, group data and almost external observation. On the other side, agent based models are related with cellular automata and computational science. The very first approach was in the mid twentieth century, it was called board model (like in checkerboards) (Reynoso, 2006). With computational power at hand, beginning in the sixties and seventies, but reaching a peak in the eighties, agent based models start to be a good option to researchers with a personal computer. With agent based models you can simulate any social phenomenon, as long as you can define the agents, the environment and the rules (agent-agent, environment-environment, agent-environment).

Ethnography and agent based models are not a new kind of rhetorical trick, but a useful tool to understand social dynamics. Michael Agar works on drugs users was an inspiring one. He was conducting a fieldwork for several years among hard drugs users, and then he builds an agent based model to test his hypothesis. The model, called “drugtalk”, explores on experiences in illicit drug, taking into account the friend’s network, where the experiences are transmitted, and the encounter with other addicted agents. All the knowledge gathered during the years was the corpus for building the model. He could find consistency even when the experiences, among drugs users, were contradictory. The agent in the model weigh their own bad experiences against their good experiences, and then make a choice of use or not the drug (Agar, 2005). The model can simulate a new drug epidemic so it is a good start for our project; at least, we think food and drug are not so different in nature.

Another work that we use as an inspiration was Stephen Lansing Bali’s “Perfect order”. In his book, the author tell us about changes in Bali agriculture by the end of 60s, when the “green revolution” was at peak. The government in Indonesia adopt the new technology, but it was a disaster for farmers. So they turn back to old technology and Lansing observes that there was not a central institution leading the process of distributing water among farmers. He realized that self organization was the strategy, farmer use, to balance the need of water. Every farmer was aware of the closest neighbour, they didn't have the whole picture. Despite this tiny range, the system works in a “perfect order”, almost like a cellular automata, reducing water shortage and minimizing plagues. Lansing use his ethnography works to build the model and to test some hypothesis about self organization and other complexity phenomena (Lansing, 2012).

We can not think in agent based models without taking into account complexity and chaos theory. And perhaps we can not think either in ethnography as a linear model, as Agar state in his paper “We have met the other and we're all nonlinear: Ethnography as a nonlinear dynamic system” (Agar, 2004). So when we work with ethnographic methods we are involved in a far from equilibrium process, a trajectory where unexpected and non deterministic issues are normal practices.

In this paper we are introducing our own model based in ethnographic fieldwork in campus university. We are in the very first steps of the project. We are exploring pattern food consumption and building our agent based model. We are designing our world, our agents and the rules that guide their behavior. Data came from the very first observations among people going to the university restaurant; we were watching them picking their meals, the distance they travel from classroom to the university canteen and the food offer they can choose (based upon diversity and price). In this first step we are not considering the other offer spots, where you can buy snacks, coffee and soda, due to simplicity, but we keep an eye on them (there are two other spots in the campus where you can buy that junk food).

The model we start to build is programmed in NetLogo because we feel comfortable with that language (and NetLogo has a great community around the world) and because Mike Agar's *durgtalk* model was made in NetLogo too and we are using it as source of inspiration. We have some experience in NetLogo, building some chapters from Axtell and Epstein's famous sugarscape (Axtell & Epstein, 1999) and we have taken some courses (MOOC) from Santa Fe Institute about complexity that were based on NetLogo.

Agent Based Models and social sciences

In this section we start describing agent based models, then we bring a brief description about relations between ABM and social sciences. We assume agent based models is not a common methodological option for social researchers, so we want to introduce some basic concepts, just an overview. After that, we describe the links between social sciences and ABM, in particular we focus on Mike Agar works and Axtell & Epstein famous "sugarscape". Although both of them have used ABM to model some aspects linked with social issues, Mike Agar has used an empirical approach, while Axtell & Epstein have used a theoretical one. We think ABM is a promising field, but we must to be skeptical and test the methods against our own hypothesis.

You can not use ABM without a computer. Although ABM has a long trajectory, starting in the 40s, with the works of Sakoda, who try to investigate what kind of patterns emerge from people relocalization (he was interested in japanese people living in the USA during Second World War) (Reynoso, 2006); the fact is that we need some computational power in order to simulate social facts. Another early work was conducted by Thomas Schelling, when he tries to understand ghetto patterns in USA. On their own words, he says he saw a pattern from a flight between Miami and Boston, a neighborhood pattern. This triggered a model about how people decide to move, based on their neighbors preferences. He showed that you don't need to have a militant racism to stay apart from your different neighbors. Even when the agent has a high tolerance to people from different groups (in the model the agent stays in his place and doesn't move while a 70% of his neighbors are differents), at the end, the simulation, shows segregation pattern (Schelling, 2006). Schelling said that he thought firstly in a board model, without computer algorithms, and when he was certainly about what he wants to show, then he starts to programme the simulation (Schelling, 2006).

Agent based models has a link with cellular automata. Although the link is more functional than historic, there are some attributes that are very similar. Cellular automata starts in the 40's, with Von Neumann, when he answers a question about if complex machine can generate a new machine so complex as itself. A question that resembles the work of nature and the way reproduction in living beings act. The answer, surprisingly, was yes and the very

first cellular automata was not the more simplest, but, anyway, it was the first in its class (Reynoso, 2006). By 60's there was a breakthrough, when John Holland found certain rules that make a cellular automata an universal computational machine. A cellular automata is an abstract machine using a board with one, two or n dimensions, with discrete cells on it. The cells can have one of two possible values, one or zero, true or false, live or death, etc. The cells turn on or turn off based on their neighbors values. There are different rules to turn on or turn off cells. Surprisingly these very simple rules lead to complex behavior. One of the most famous set of rules is John Holland's game of life (Reynoso, 2006). If you are working on two dimensional square lattice, then you can apply, depending on your interest, two kinds of neighbouring. The first called "von Neumann neighborhood" is composed by the cell itself (ego cell) and the four cells surrounding it. This neighborhood is orthogonal, it does not take into account the diagonals cells. If the cells surrounding ego are just one ahead, then it says it has a one radius of distance. The other is called "Moore neighborhood" and is composed of ego and all the cells surrounding it, including those in the diagonals. Here also apply the radius distance, so you can say a radius one, Moore neighborhood. Obviously, this neighborhood has more reach than the first one, but because complexity and chaos (emergent properties), that does not means a more enriched behaviour. Using one or another depends in the cellular automata goals, and in the set of questions asked by researcher in the process of building the model.

Agent based models share certain characteristics with cellular automata and have some differences too. Again, this does not mean a better approximation, but is a matter of researcher choice. Both are discrete models and both lies on the grid board and both responds to neighborhood pattern (local interaction is very important). But agent based models has agents "living" in that grid. It means that any agent can have more than a single attribute like cells in cellular automata (i.e. true or false, on or off, etc.). Agents can have multiple variables describing them with differents kinds of nature: boolean, but also string or numeric values. Of course these properties can be very different among agents, bringing heterogeneity and variability to our model. Beside properties agents, they can have behavioural rules, that determines their own behaviour and the relations between them. In agent based models, grid or world (as we usually call it), is computationally active. You can set any variable to any cell, with any kind of types, like numeric, boolean, string, etc. Beside that, you can set rules to interact with agents or with other parts of the world (another set of cells). With all this stuff you can simulate almost anything you want. One of the greatest feature, ABM has, is its ability to play or experiment with heterogeneous agents in heterogeneous environment. Here, difference are of great importance, resembling, in some way, ethnographic research. Some researchers (Wilensky & Brand, 2015) argues that when you have a huge set of components, the best strategy is to use statistics; when you have just

a few components, your better strategy is to use ethnography, but when you have a number between huge and a few, your better strategy is to use agent based models.

Another way to understand agent based models is to think in terms of agent rules inferred from fieldwork, and when you run your model you can get some statistical data. In this way we can think in agent based models as an interface between classic fieldwork (microsociology) and statistics (macrosociology) or to put it in more accurate terms, agent based models are something between local and global interactions.

In social sciences, nowadays, this kind of models are starting to grow, because they are relatively simple to design, build and test (or analyze) and everybody has a computer at hand. Agent based models can be used to test theoretical or empirical hypothesis.

In “Growing artificial societies. Social sciences from the bottom up” Axtell & Epstein build up a society with heterogeneous agents and a changing environment with scattered resources. The authors set different properties to agents, from sex to culture and test differents scenarios, where disease can spread or trade can emerge. They are not simulating actually a known culture or a known society, but a theoretical one, made up of certain attributes and certain rules of behavior. They try to understand the dynamics behind social facts, like transmission of culture or the emergence of wealth and poverty. The agent-agent and agent-environment interactions are the basis for their experiments (Axtell & Epstein, 1996). But agent based model can be used to simulate some real life facts, to test empirical hypotheses.

Stephen Lansing build a model to watch for some questions about how in Bali, the water temples can regulate water use, and doing that, reach an optimal state about not spreading disease among crops. Surprisingly without a central authority, water can be managed in an optimal way. Running the simulation model let Lansing analyse the ecological functions of water temple networks. He saw in the hillside of the mountains in the Ubud region in Bali, the astonishing landscape of rice terraces, and based on his fieldwork, he built an agent based model to test the dynamics ruling the system. He showed how traditional techniques are more sustainable than those techniques brought by green revolution in the 60s, when global organization like FMI and World Bank start to pressure governments to adopt agricultural techniques developed in western companies (Lansing, 2012).

Another example of agent based models that lies in theory more than in empirical issues, is the work of Mitchel Resnick, at least when he wrote “Turtles, termites and traffic jams: explorations in massively parallel microworlds”. In this book he looks for complexity patterns emerging from single interactions among agents. He browses through a lot of examples, ranging from artificial ants to traffic jams, showing the power of discrete models; how simple interactions leads to complex shapes and behavior. One of key concept is the notion of multiparallel process, the fact that synchronicity can be possible in simulations (not only in

real life), despite the fact that computers simulates parallelism, in the same way computer simulates random, anyway it works!. He is not testing only some kind of complexity themes, but bringing a more philosophical view, including education and epistemology (Resnick, 2002).

Robert Axelrod uses simulation to play around with some strategies on game theory. He analyses tournaments where agents can defect or cooperate, resembling the classic prisoner's dilemma. Testing whether is better to cooperate than defect. He shows a version of the game where more than two gamers play, leading to complex behavior. Axelrod thinks in game theory from a theoretical point of view, as a model to emulate differents kinds of behavior in differents domains, like biology or a social environment. Game theory was used mainly in economic theory, but also in psychology or political science. In fact in "The evolution of cooperation" he analyses the World War II factions (european countries) in terms of their alliances before the breakdown of war. One conclusion was that a rule who is a better strategy is that known as "TIT FOR TAT", who promotes cooperation than defection (Axelrod, 2006).

These authors presented here, are just a few of the growing field of simulation in social sciences. There are much more people involved with agent based models around the world. We pick them because they are in a sense, some kind of pioneer in the area, but they are not the only ones. In the next section we introduce Mike Agar's work, because he was, perhaps, the most inspiring researcher to us in this field, where we mix ethnography and agent based models.

Ethnography, agent based models and consumption patterns.

Our main source of inspiration in terms of agent based models is Mike Agar's works on hard drugs addicts. He has conducted fieldwork for a lot of years and then he realized he can build an agent based model to deeply understand the dynamics of drug consumption. He was interested in the experiences of addicts, in fact in how an individual became an addict. How a new drug could spread all over addicts or future addicts and how people engaged in drugs process and decide whether or not to consume the new drug (Agar & Reisinger, 2001). His experience doing ethnography was a major source to build the agent based model, we can call it an empirical strategy for design (it does not mean that you can't have any theoretical hypothesis but your main source is your own fieldwork).

In terms of agent based models you can choose one of two major strategies in order to start with design. Top to down or bottom up. The first implies that you know the end results of your model and you start from this point. The second implies that you know the agent rules, you code them and then wait to see what the outcomes are. In the first strategy you must to

figure out what rules can emerge from those outcomes; in the second you know just the rules, and the agents involved, but you want to watch what can result from those interactions. If we are talking about social science research, then using models based on ethnography can be a really success.

He assumes an EMIC point of view when he developed the model. An EMIC viewpoint is that where categories came from those who are being modeled; i.e. social actors. When you use this approach you try to understand the world in their own words. He decided to use native categories. The experiences are the raw material Mike uses to do ethnography and to build the agent based model. He conducted interviews with young people engaged in drugs consumption, some of them who have been judicialized and met in drugs education programs. The goal of the project was to try to understand how drugs experiences are processed by individual and among their neighbours and how they communicate to each other through their own friend network. On the other side Mike tries to look for the effect of a new drug and the possibility that this consumption rise an epidemic. He takes into account the attitude toward experiment with new drug and the experience emerging. This consumer experience and the network are the basis for their NetLogo experiment (Agar & Wilson, 2002).

We want to remark that drug consumption and its probably epidemic is similar, at some extent, with food consumption. Both cases are based on friend's networks (or family), both (drugs and food) can be seen as addictive. Both spread through the network, shaping a kind of epidemic of non transmissible disease (the first is addiction, the second is obesity). Both are related with new stuff (a new drug, a new kind of food) and both are a XXI century public health problem. These facts lead us to the hypothesis that the epidemic dynamic in both cases could be very similar, at least to some extent.

In this sense we use Mike Agar's works, ethnographics and agent based models as a source of inspiration, to say the less. We try to emulate agent experiences in relation with food consumption, how they evaluate that experience and how that information is transmitted throughout the network. What is most interesting from our perspective in Mike's works is how he managed the contradiction between agent's own experience and the information that goes through the net. How even, when the experience is a bad one, they engaged in drug consumption. This has a very similar structure with food experience, not in the sense that is a bad experience (junk food could be very tasty) but in terms of their own health (everybody knows junk food is a bad choice, but even if you have got the money to buy healthy food, you finish buying fast food). Another issue that we can use as a structural similarity, is the friend network importance. Since food consumption is a social choice (not always but people tend to eat not alone but with colleagues), we can hypothesize about the strong role the network plays in food elections.

So we start to conduct fieldwork in the university campus. At this point we only explore the spots where people buy food and eat. These are campus restaurant, where students, professors, administrative staff and the people who visit the university can buy more elaborate meals; and two kiosks where people can buy mostly sandwiches or candies or cookies. There is also a kind of food truck that park outside campus boundaries, but at one of the door, who sells salads and sandwiches but in a more “organic way”. These are the stores where people can buy food, but they can too bring food from their own houses. This strategy can not be the most popular, because it implies to prepare and cook with anticipation and not always people have the time to achieve that. We were observing how people tend to join in commensality, how they try to eat together with their friends and colleagues. There are three ways we observe where people eat. The first is the restaurant with their chairs and tables. The second is the campus itself, I mean, the grass, like in a picnic, this behaviour is observed when the weather is warm, mostly in spring and the beginning of summer (in middle summer usually we are in holiday season). The third is the office, in some institutes inside university, the institutes buildings have a dining room, with a tiny kitchen (a refrigerator, microwave oven, etc.) where people eat together.

We have not start to gather systematic data, but to explore the field. This is due to our research project is waiting for funding (new conservative government in Argentina are delaying science system payment) even when it was approved one year ago. Despite this administrative issue, we start to explore those spot where people buy some food or eat together. With this information we start to build our agent based model, to try to emulate food behaviour pattern among those who eat in the campus university. Building the ABM from the very beginning can lead to return to our fieldwork with new questions and a more accurate view. Mike Agar used to say that ethnography is a non linear process (Agar, 2004), where you never finish actually and where you do a kind of feedback between EMIC and ETIC categories (at the very end, written by the ethnographer) and raw empirical data. And this dynamic must be used when you want to mix ethnography and agent based models. So we can end with a kind of three epistemological layers working together: raw empirical data, EMIC and ETIC categories (discover and creation) and agent based model. In the next section we introduce our very preliminary model, coded in NetLogo. We will show source code and some print screens and we will describe the main functions and the first model objectives.

As we mentioned earlier we are working in a multidisciplinary team, with nutritionist, chemist and medical doctors, so we think that build an agent based model can be a very useful scenario to get a common language. In an agent based model you run the soft, so there is some kind of “reality”, in the sense that agent have relatively autonomy. We set the rules, but when the model is running, the interaction between agents, based on those rules, can lead

the model to unpredictable results. Agent based models usually show complexity behavior, emergent properties we can not predict from initial state. On the other hand, the fact that we must be very clear when coded the rules and set the agent and environment properties, shows no ambiguity or at least reveal our own errors or inconsistency about the phenomenon we are trying to model.
So this is our first attempt to build a model, having into account ethnographics material, but probably we can extend our model or build another in order to satisfy other requirements from nutritional facts (anthropometrics or hypothesis about food nutrients) or from other sources (medical, etc.). In any case we think that building a clear model (clear in the sense that define agents and rules and environment and their rules, and the interaction among all these elements) can lead to better understand not only the phenomenon itself, but a new language for all the disciplines engaged in the project.

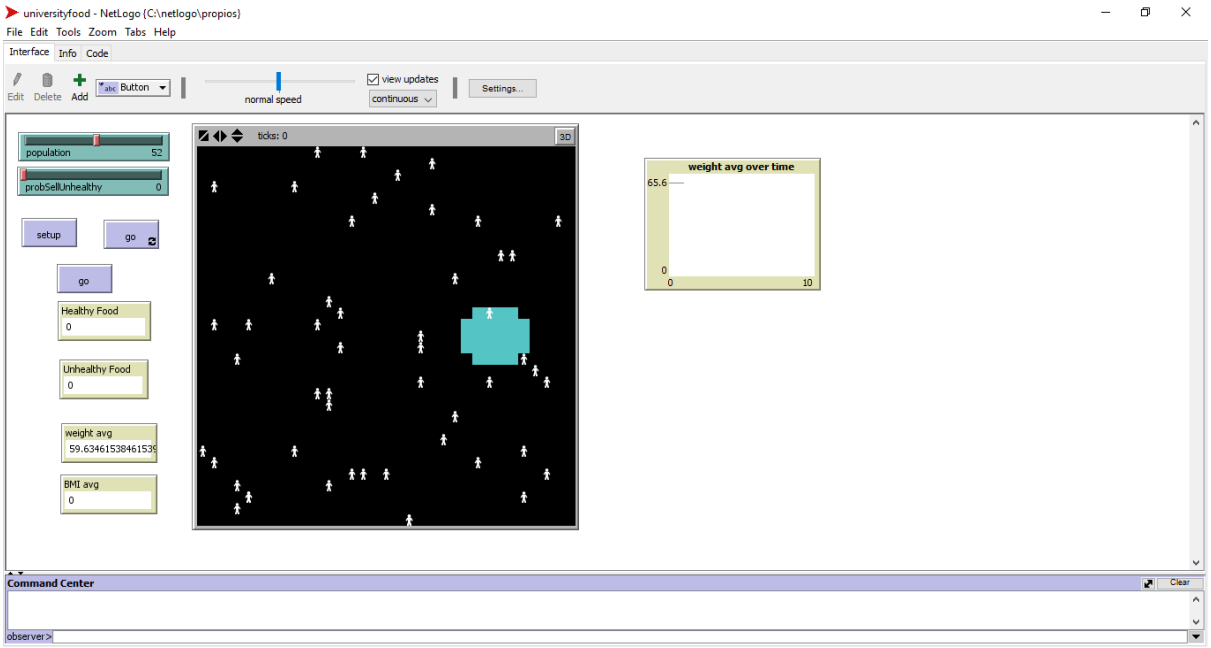
Food pattern, qualitative methods and simulation models

We start from the very beginning, with most simple behaviour about food consumption. We are ruled by KISS principle (Keep It Simple, Stupid) as was stated by Robert Axelrod (Axelrod, 2006). Despite the fact we encounter differents kind of people doing differents activities in the campus (professors, students, staff, general public) we start to design our NetLogo model, thinking in just one type of people, a generic one. Following Billy Rand and Uri Wilensky rules, we try to build our model toward to answer our questions (Wilensky and Rand, 2015), even when we know this is a simplification about reality. But we try to figure out how emerge food consumption, so after that, we have plenty of time to make our model more complex (and perhaps more realistic). On the other hand, there are a lot of reason affecting food consumption, like income, supply, imitation, culture history, memory food (i.e. the last meals eaten), etc. In this version we work with just one of those causes, imitation. Even when, in the campus, food supply is not very diverse, we simplify all the stuff agent can buy, by two kinds of meals: healthy and unhealthy. Again we follow here KISS principle. When you are modeling, what is most important, is to try to answer the primitive questions and not try to imitate what is going on in the real world. This is the heuristic power of agent based models. There is a theoretical distinction between “high fidelity models” and “low fidelity models”, that reflects this kind of approach (Gilbert, 2008). Our experience developing simulation models, says that if we want to reflect all the real world details, then the model turns unmanageable.
So as we have stated, our agent are all from the same type, we are not at this time making any difference (professors, students, etc.). When you set up the model, you can choose the number of agents living in the world, the range goes from 1 to 100, but if we need more

agents, it is very easy to do. The other parameter you can change, at this stage, is the probability of the store to sell unhealthy food. It means the food store can sell healthy or unhealthy food based on this probability. In fact we use “foodchoice” function to decide if he/she is going to choose healthy or unhealthy food. In “setup” routine, we also draw just one food store for the sake of simplicity. When we run the model, the agent starts to walk in a random fashion. On each time step (tick is the name of time steps in NetLogo) the agent spends some kind of energy due to that random walk. This is the origin of agent appetite and the threshold leading them to go to food store.

When agent arrives to the store, then start the process of selecting what kind of meal is going to eat. Choosing meals is a very simple process in this stage of the development. We plan to increase their choices in the next future, but by now we just follow majority rules. If the agent arrives alone to the store, then the choose process is simply a matter of probability. Just 50 percent of chances to pick healthy or unhealthy food. In the next model release we are going to consider his own history, if he has no food history then the choice is random, but if he has food history then he could decide random but with more chances to pick the last meal he took. If he is not alone at the store, then he will decide based on the other agents choose. If the majority choose some unhealthy food, then he will follow those elections, if it is a tie, then again he chooses his meals based on random (50 y 50) mood.

In the next model release we are going to consider a network of friends to simulate. While many people often go alone to the university restaurant, others may have a recurrent bunch of colleagues with whom they share the lunch time. We have observed this behaviour in the workplace, people tend to eat with the same friends everyday, perhaps a kind of Victor Turner communitas? (Turner, 1988). Commensality is a powerful social fact and people, usually, dislike to eat alone. We suspect that this social network may influence meals choice, due to imitation tendency. Culture, in facts, flow by means of language and imitation (Díaz Córdova, 2009) and this is true for eat behaviour too.



University food NetLogo screen

So, from Mike Agar's works we took two big influences. The first is about how to use ethnography to build an agent based model. Or more generally, how can we use ethnographic data not as a goal itself, but as a point of departure to develop another product; i.e an agent based model but also a documentary movie or a workshop or even as a collection for a museum (Agar, 2004). The second is the agent based model itself. We think Mike's model (drugtalk) can be used as a source for our own model due similar dynamics in drugs and food epidemic (can we talk about food epidemic more than obesity epidemic?). And we are interested in how he, as an ethnographer, could get those main (in the model sense) characteristics that lead to the spread of the new drug. So we pretend not to be so clever and smart as Mike was, but to find some criteria to simulate food dynamics in university campus.

On the other hand, as we stated, one of the aims of this simulation model, is to find a common language with our colleagues from the other disciplines involved in the project (medical doctors, nutritionists, etc.). A common place where we can discuss our issues (hypothesis, questions, goals, etc.) about research problems.

Future perspectives

We have presented here the first steps of a research about food consumption in university campus. We were inspired by Mike Agar's works about ethnography and agent based model. Agar did fieldwork among drug user addicts and then use their insights to build and design an agent based model. We think drugs user dynamics are similar to those ruling food consumption. So "drugtalk" model (the agent based model developed by Mike Agar) is a

very good place to start our own exploration about epidemics from a sociocultural and cybernetic point of view.

Agent based models are very useful in differents contexts. They can be used from a theoretical or empirical point of view. They can be used as a tool to check some fieldwork insights, generating a kind of feedback between empirical data and computer models. We, social scientifics, almost for the first time in history, can test our hypothesis in a controlled environment. One of the most important benefit ethnography brings is the ability to pull out social rules, what actors make (material and symbolically) in order to reach their goals. In this case, related to food goals (what they want to eat, how they can get them, with whom they want to share meals, etc.).

People at meals times are not very creative on the daily basis. We tend to repeat, and this behaviour is even more constrained by food supply and budget. There are little bit variations from day to day, more shaped by food supply than budget restrictions. At least in the university campus, we do not pretend to extend this hypothesis to society as a whole, but we must mention, to tell the truth, that food diversity in marketplace is shrinking from year to year (Sharp, 2012), at least since after II World War and this is a global tendence. So, in a sense, is not so difficult to model actors rules about food and translate them to programming code.

Mixing ethnography and agent based models could lead to a new anthropological approach, a new kind of methodological triangulation among fieldwork, anthropological analysis and a new scenario (computer's model) where to test hypothesis, and experiment with ethnographic data. Agent based models have the advantage to let us develop almost any social scenario. As Mike Agar demonstrated, you can simulate in an agent based model even the contradiction emerging from informants discourses. And that is because we, Homo sapiens, are very contradictory in social and individual terms. One of the main effects of ethnography is to solve, using differents semantic layers, the emerging contradiction and with computer simulation this can be proved and tested. We can understand, in a comprehensive way, why people says yes and no at the same time, one of the issues in social complexity.

Our next steps are based on do fieldwork in more depth mood. Systematically put our efforts on try to break through famous and classic "thick description" (Geertz, 2006). We are thinking in using some kind of ethnographic app to collect data, not only from ethnographers but from informants too. We (ethnographers) are now, technologically, capable to be linked and connected with our informants even when we are not "there" (no more "I was there" assumption?). Something like that was written by George Marcus in the middle of 90's about multi-sited ethnography (Marcus, 1995). As we stated earlier on, we are waiting from promised and approved funds, but conservative government doesn't look very concerned

about science in general. In the meantime we can start with ethnographic work (mainly exploratory, but with some interviews as well), because it is more cheap than chemical analysis (one of project main component). Ethnographic data will tell us about food consumption pattern, bringing consumer rules, where a permanent negotiation is undertaken on every alimentary event on a daily basis.

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