

Youth at Risk Groups: Are They Autopoietic Systems?

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Abstract

The development of systems thinking methodologies and approaches allows researchers to reach a better understanding of how complex living systems behave and evolve over time.

In this paper, we suggest some conclusions related to an ongoing study of “youth at risk groups” (YRG). Youth at risk and juvenile crime have become, in the last two decades, one of the most important issues related to public safety and quality of life in Latin America’s urban areas. For us, YRG are autopoietic complex living systems, and, from our experience, this concrete approach gives a solid basis for the understanding the problem and the design of public policies to deal with it.

Our approach is integral, systemic and holistic. Therefore, it stems from the very early stages of the problem –family, school, and neighbourhood– till the last consequences of its evolution: drugs consumption, crime, and the relationship of the YRG with the police, the criminal justice system and other governmental agencies.

At the same time, the paper points out the efforts by the government of La Rioja to deal with the problem, trying to reduce damage, looking for “win – win” processes and prioritizing the best interest of youths, as stated in international documents and agreements.

The paper overviews the experience of the last three years in the State of La Rioja, Argentina, where we have been working with systems thinking tools.

Introduction

The extension of the concept of *autopoietic system* to any living system formed by organisms or communities of organisms has been and still is a controversial issue (Capra, 1996). In this paper we do not pretend to submit a definite answer, but to provide data related to some field experience that could help us find keys to this issue.

The paper gathers, on one hand, elements from well known studies on youth at risk groups (YRG) though reconsidered through the special characteristics of our epistemological approach. On the other hand, it provides concrete field work information from our experience in La Rioja, Argentina, since 2003.

Apart from delving into YRG and their behaviour, the paper introduces a consideration about how intergovernmental agencies behave (Morcol, 2003; Meek, 2005). This is because we found surprising similarities in the way that different systems work: not only do YRG operate as self organizing systems but also intergovernmental agencies do.

In Argentina, we consider youth at risk groups those groups made up of a number of youngsters that number from 5 or 6 to more than 40; with ages ranging from 13 to 20 years old and they are involved in two or more of these types of behaviour:

- Commission of crimes or misdemeanours
- Habitual use of drugs, alcohol beverages or glue inhaling
- Inconsistent or ineffective parental control
- Behavioural problems at school
- Negative influence in peer relationships

Chaotic systems

Needless to say that the term CHAOS in Science does not imply absolute disorder or hazards, but it points to a special kind of behaviours and processes that verify non linear systems that behave oddly and unpredictably. In a chaotic system, a simple set of initial conditions can lead to very complicated and unpredictable consequences. Chaotic systems, as complex systems, display the following characteristics:

- Indefinite number of elements and components;
- Non linear and asymmetrical relations among such elements;
- Feedback processes among such components;
- Behaviour that may seem to be hazardous or disorder but responds to underlying patterns;
- Unpredictable behaviour under a boundary of stability;
- Sensitivity to changes in the environment;

Capacity of adaptation and co evolution.

Systems formed by human beings, like couples, families, gangs or soccer teams, are also complex adaptive systems that fit into the aforementioned characteristics. Among them we can also consider YRG. The concepts and tools arising from Complexity theory are useful to explain the conditions from which these groups emerge, and the way they behave, evolve and adapt themselves in a given environment. They also help us to design political strategies in order to deal with the YRG and neutralize them.

It is important for us to mention that the approaches provided by complexity theory break away some deeply rooted statements of traditional positivist science, based on the Newtonian Cartesian paradigm. In that sense, the new approach overcomes pretensions of reductionism, objectivity, fragmentation of reality and any idea of reaching some kind of “scientific truth” that may be sustained *erga omnes*.

As for criminal matters, reductionist visions had their expressions and theories in the XIX and XX centuries; for example anomie, lower class reaction, social disorganization, social labeling, stigmatization, social control theory, and others. At present, it is generally accepted that the causes of crime and social dysfunction are multifaceted and multicausal in nature, (Kessler, 2004).

The basic and starting guideline to analyze this issue is to realize we face a complex reality; we cannot approach it by trying to explain or understand individual or isolated parts. On the contrary, the new strategy believes that the functioning of a complex system can be pinpointed and understood from an appropriate perception of the synergic interaction of its interrelated and interacting parts and processes. Furthermore, according to the latest trends in systems thinking, a system is not made up of parts by it is composed of relations, processes and interactions.

Therefore, if our basic system is a YRG, this cannot be deemed as a mere group of adolescents with different dysfunctions. In order to fully understand this phenomenon we must comprehend the social, economic and cultural environment from which these groups emerge and develop, as well as the manifold conditions interplaying to strengthen or weaken their robustness.

Characteristics of the YRG as Complex Systems

Research on complex adaptive systems has allowed the systematization of the main characteristics of the way these systems behave. This systematization facilitates the analysis of living system process on different levels, ranging from the most basic, like cells or microorganisms to the most complex such as cultural, ideological, symbolic and social systems. Among those characteristics we are going to mention the ones we consider best applicable to YRG.

Structural coupling: A living system keeps a record of disturbance with its environment. This disturbance dynamically triggers the system’s possible states, as well as constitutes a response that enables the system to remain structurally coupled to the environment, thus keeping its homeostasis.

It is important to point out that the system does not only reactively respond to the inputs of the environment but also brings out or produces changes in the environment in order to deal more accurately with it. That is to say, it reacts and, at the same time, operates in a proactive way generating the co evolutionary process.

Complex systems keep their homeostasis as long as they can consistently deal with a complex and changing environment.

The threats of the environment faced by the YRG are the ones that may affect or influence the group as such -for instance, governmental schemes like the ones related to schools, labour training or social aid – and they typically function as a threat that the group will try to repel.

The threats of the environment challenge the immunological capacity of YRG in order to defy the attempts to modify their dysfunctional behaviour. Consequently, if the governmental schemes are not systemically viable they are bound to fail.

An interesting phenomenon of structural coupling between a YRG system and the environment, pointed by Kessler (2004) and that has been witnessed by us in La Rioja is the result of the interactive behaviour of some teachers from state schools and YRG members, in order to remain in the formal school system. Since these adolescents cause disturbances within the classroom, both students and teachers strive to reach a compromise, i.e., the former agree to behave properly while the latter lower the standard academic requirements. Although for them both it appears as a win-win process (and even for the rest of the students, who can have their classes in peace) it turns out to be a negative sum, for the rest of the society as a whole it is a negative sum.

Boundaries: Every complex system is a set of subsystems. This entails different interrelated components. A part of the system is different from the other and, the system as a whole can be recognized because we can distinguish it from its environment. We call boundaries to the areas in which the system and the environment exchange energy, matter and information.

Complex adaptive systems, as autopoietic systems, delimit their own boundaries, differentiating themselves from the environment from which they receive inputs of matter, energy and information. Should this not happen, we would be unable to distinguish the system from the environment. Although some aspects of autopoietic systems could be disputable, there is no doubt about the fact that YRG are made up of autopoietic systems. That being the case, the groups, as any other living system, delimits their boundaries; prescribe their differentiating hierarchies as well as functions and roles.

We can mention in this aspect some formal mechanisms of incorporation or expulsion from these groups (like special acts, rituals, crimes that newcomers have to commit), gestures with the fingers, graffiti, special names, special clothes and other communication codes. They also mark territory defining who may or may not pass through.

Co evolution: Co evolution between the system and the environment is a critical process in which living systems interact with the systems of the environment through a mutual and permanent transformation. We must remember that the environment is not a sort of nothingness or an empty space but a set of infinite systems. Therefore, it is important to realize that the co evolutionary process, in the same way as the structural coupling process, implies the interaction and transformation of the system with specific systems of the environment.

In the YRG, for example, it is feasible to find and identify co evolutionary processes connected to the neighborhood, the police, the schools and the families, as well as to the government -considering that it is the source of any political answer.

In the context of evolution of these groups, when they first start to gather in the streets, their neighbors usually start to worry and call the police. As soon as the group begins to exhibit more dysfunctional behavior- like drinking beer or alcohol, smoking marihuana or street fighting-, the pressure on the police increases. Usually, the police react enforcing surveillance with cars in the area or some dissuasive though superficial measures.

While the number of thefts and robberies grows, some neighbors also implement reactive preventive measures, like accompanying relatives to the bus stop or to out to buy things. Some other measures take are related to home safety, like installing alarms, buying dogs or building stronger fences.

As the problem continues getting worse, new operations of co evolution appear. Among them, the most frequent manifestations are neighborhood meetings with the police, pressure through the media; cut of streets and demonstrators blocking roads.

Self organization: YRG fully meet the prerequisites stated by Gao and Charlwood (Francois, 1997, 309) to say that we are facing a self organizing system: openness; non equilibrium operation; non linear relations among components; fluctuations within the system and variation of the environment that triggers different states of the system.

Being dissipative structures that operate far from equilibrium, YRG pass through bifurcations and chaotic processes, reorganizing and self organizing themselves, sometimes evolving into more complex systems. This is, for example, the case of a hipercycle, i.e., when they evolve from a mere vulnerable group to an instrumental gang selling drugs or guns.

Once the new structure appears, the system shows new emergent properties. Whenever a strong, intense, flow of inputs from the environment is being received by the system, such an event leads to a crisis that jeopardizes the homeostasis of the system. In La Rioja, for instance, when some group leaders are tempted into entering in a labor training or educational courses the group sometimes tends to cease to be a source of problems. On the other hand, some times, new leaders appear or the group drifts apart.

In other instances, when a systemic strategy is in progress, the group as a whole turns into a hipercycle and adopts a completely different behavior. This was the case of a group named *Los triceratos*, a highly dysfunctional group in the area of Police Precinct 4 of the city. Through over a year of labor training and educational support, 19 from 20 members of the group turn out to be members of the Ecological Brigade, receiving a small amount of money for cleaning open spaces.

Butterfly effects (extreme sensitivity to initial conditions): As it has been stated quite as a cliché, in a complex system a very small change in any particular situation -even in a not very significant subsystem- can generate enormous consequences in the whole system at a given time.

In the process of working with YRG we have found several concrete situations where butterfly effects are taking place.

More than once, the resignation of a public servant who was carrying out a certain strategy may lead to undertaking a completely different strategy.

It is also frequently that a very small difference in opinion between two public leaders may provoke the fragmentation of a whole public policy. A very small delay in a response in a social program may end up in a violent situation, even a homicide. Small problems among groups can lead to fights or make a youngster abandon a program.

There are also many “butterfly effects” reflected in issues like police intervention in public streets. There are many cases in which, if the police force is unable to keep a strong emotional equilibrium while facing provocative behaviors, violence occurs bringing about harmful consequences. Again and again, very small inputs produce huge effects.

Non linearity: Apropos of classic mathematics, the knowledge of a variable and its correct use enable us to reach the value of another variable, as long as both variables are linearly related. Nevertheless, in complex adaptive systems processes are subordinate to a plentiful, when not infinite, number of variables that interact in an asymmetrical way operating all kind of non linear effects.

Such rule, fully applicable to YRG turns strongly unpredictable and non linear the behavior of the system, due to the fact that it is submitted to so many factors and influences.

It is worth mentioning an example which reflects the way we face this aspect of YRG systems. Police officers integrating a special unit, called Community Prevention Brigade, develop a complete and exhaustive investigation on each group, with a particular accent in member's needs and ambitions. At the same time, a conversation process starts in order to build up trust and confidence with them.

Once possible political answers are found and prepared by the Head Master team, and they are accepted by the YRG, they are implemented. However, as soon as this happens, other non linear effects appear everywhere.

Problems might come from different sources: from the group (such as quarrels with other groups); from the community (negative reaction from the neighbors or lack from parents) or from the government (delays in responses or promises not accomplished). All these factors produce alterations in the program that oblige continuous reviews.

Unpredictability: Like non linear effects, and in the light of the complex interdependence of a great many factors, components and interactions in the field of YRG, its precise future state is unknown and always impossible to foresee.

Science and observers can ponder or consider several feasible future states, but never a precise one. It is true that the more information we gather and the broader the research we do, that the level of unpredictability we find is less. That is why the work of the Brigade, gathering information, is so important. In addition, we sometimes encounter completely different outcomes to similar responses or strategies.

Interdependence and emergence: Different individual behaviors interact with each other. As a result, we witness the emergence of the behavior of the system as a whole. The individual components of a system interact and influence on each other reciprocally. Each and every components as well as interaction of the system depend on the rest of it; indeed, any change in any part affects the rest.

When it comes to YRG, the main interdependences are related with neighbors, police, schools, other groups and governmental agencies. All the relations show the interdependence and co evolution processes aforementioned.

It is worth lighting that the same components but in a different structure – namely a different interaction among components – leads to a different emergence.

Related to this, it is interesting to analyze how the emergence of a process differs, for example, in the relationship the YRG's members have with the police. If the former face a confrontational attitude from the latter, the outcome will be violence, attacks to police vehicles or headquarters, insults and so on. On the contrary, when the police's attitude is friendly, the reactions are completely the opposite.

The changes in individual behaviours also affect the general performance of the YRG as system. Moreover, the system as a whole also, in turn, changes when the environment changes.

Humberto Maturana has stated that *“since the properties and characteristics of the living are determined by their own structure, as far as there is a modification on the structures of the living that integrate a social system, their properties change and the social system that they integrate with their behaviour also changes”* (Maturana, 1999, 27).

The experience developed in La Rioja displays encouraging outcomes of emerging behaviours that are strongly consistent with a strategy of support to YRG members. In such cases, the same youngsters who previously committed crimes and all kind of misdemeanours start to develop to develop collaborative and socially useful attitudes and behaviours when they are involved with other types of people: in other words, the environment has changed.

While finishing this paper, 34 youngsters that had attended a labour training program were hired by the private sector and are working there with excellent performances. Their recruiters accepted not to ask them certificates of good behaviour, a usual requisite in the Argentine's labour market but something that, given their backgrounds, would have been impossible to obtain.

Attractors: Attractors represent the dynamic tendencies of systems. In turn a change in system's structure leads to a change in the attractors. Complexity theory recognizes different kind of attractors, namely point or fixed point, periodic, chaotic; being the latter the characteristic one of complex adaptive systems.

In our opinion, in children and younger adolescents, the inhaling of glue operates as a recursive attractor in the same way as marihuana and alcohol consuming does in elder young people. All of these attractors operate also in a collective way that reinforces the spirit of belonging to a group.

In general, all dysfunctional habits of the YRG are attractors in the definition previously given. Nuisance, money begging, alcohol or drugs consumption, attacks to police vehicles, fights between groups, harassment to people in the streets or stores, etc.

It has also been stated that “mental models” and systems of belief are strong attractors. Our perception from the field experience is that this is a correct view. The members of the YRG are struggling to build up their own identities within a particular unfriendly environment. Usually they are the result of disorderly families; school dropout or failure, problems with the police and the justice system and political manipulation. What they seek in the group is basically self esteem, sense of belonging and personal safety, that is, everything what they do not find in other community subsystems.

Whenever there are serious political strategies focused on providing these elements, there is usually a change in the attractors as a result.

It is true that in the political field several decisions exhibit the tendencies of a strange attractor. Typically, as regards police and safety, when there is a rise in crime there follows a subsequent increase in violent repression and hard-line measures, though it is well known that this type of answers do not offer any solution.

Variability and creativity: System adaptability depends on the organizational closure of its own state. We know from Ashby's law of requisite variety that, in order to deal with a complex environment, systems can either reduce the complexity of the environment or increase the system's capacity of variability to maintain homeostasis. We think that these principles can also be applied to complex adaptive systems.

In this area, creativity and generation of novelty plays a significant role. The YRG exhibit a robust capacity to face and deal with environmental threats such as governmental schemes, neighbors' reactions, police intervention or school restrictions and constraints. Examples as the one given in the school system show this capacity as well as the creativity employed by YRG in order to continue behaving in the same way.

There are many examples of variety. When YRG negotiate with political leaders and exchange favors during electoral campaigns, literature and field experience show that young people from less developed social areas can be well recruited for political works as registering voters, inviting people to meetings, being in charge of the advertising in the streets (signs, flyers, ballots distribution, moving people to vote the election day, etc.)

In payment for these favors, political decision makers are usually compelled to provide YRG members with money, jobs in the public administration or

just impunity when they face problems with the police or the criminal justice system.

Autopoiesis: The basic definition of an autopoietic system states that it is a system that reproduces itself. No matter it has been controversial and it is still under discussion whether social systems are autopoietic or not, it is generally accepted that many aspects of autopoietic systems are fulfilled by social ones.

The consideration of YRG as autopoietic systems obligates to replace the concept of adaptation for the structural coupling, considering that the relation system – environment is a relation in which inputs from the outside do not condition or determine changes in the system but trigger some possible states in it.

The capacity of keeping themselves clearly identified and differentiated from the environment is also a proven characteristic of YRG. In that sense, it has been repeatedly stated that this kind of systems are open to the flows of raw material, energy and information from the environment, and at the same time they maintain their own organizational closure, reproducing the components. This very last aspect may be the most difficult to fit into the classic formulation of autopoiesis by Maturana y Varela.

In that sense, we can argue that YRG meet some of the characteristics that Fleischaker states for autopoietic systems, considering that they are: 1) self sustaining; 2) self reproducing and 3) self perpetuating systems (Capra, 1998, 219). In his challenging synthesis of a new theory for living systems, Capra also considers the nature of dissipative structures and network pattern of the living systems, both aspects also fully met by YRG.

The YRG emerge from an environment always characterized by some of these aspects: familiar dysfunction, scholar crisis or failure, bad use of spare time, lack of useful activities and programs, easy access to drugs or alcohol, and there appears a factor that usually triggers the autopoiesis of the group: the peer group influence.

Once the group is formed, it keeps its homeostasis by not only strengthening the relations among its members but also providing them with a sense of identity. In these cases, it is habitual that the members of the group get involved in activities of robbery, theft, larceny, destruction of public property and others. Besides, the homeostasis is kept by the rejection to community or governmental interventions that the group perceives as threats.

Another interesting issue, following Maturana and Varela, is the distinction they make between autopoietic and *allopoietic* systems, being the latter those systems created or made, and with external control. Their organization and components are not self organized. For us, this is a crucial distinction for the understanding of YRG as autopoietic systems, because these systems have the capacity of *learning*, something that takes place in a circular reinforcement feedback process with the environment. For that reason, the consideration on creativity and generation of novelty of these systems is very important. Of course all these characteristics do not relate to allopoietic systems.

Developing policy interventions

The success of a comprehensive continuum of interventions and, eventually sanctions, depends on a proper identification of specific types of offenders for placement in the various levels of intervention (Howell, 1995)

La Rioja's strategy categorizes young offenders in four basic types, for such types specific strategies and measures are developed afterwards. There are four types of strategies according to the level of risk:

Habitual delinquents: some about 30 / 50 youngsters. Given the fact that they are dangerous cases, a special state correction facility has been prepared for these juveniles, they are deprived of freedom under judiciary supervision.

Occasional delinquents and group leaders: Around 150 / 200 youngsters. Special programs tailored ad hoc are implemented for this sector under the supervision of the Undersecretary ship of Addictions and Youth Violence Prevention and the Head Master Team

Members of Youth at Risk groups: Around 1000 youngsters are involved in special programs of education and labour training, managed jointly by the Education Department and the Industry, Trade and Job Department and under the general supervision of the Head Master Team.

Rest of the youth: Area under the state government policies in its different departments.

Head Master Team

The creation of this Team was a cornerstone in the development of the general strategy. This team has been designated for designing and implementing youth policies within the second and third categories. It is formed by the following governmental areas:

Undersecretary ship of Addictions and Youth Violence Prevention.

Police Officers of the Community Prevention Brigade.

Program Coordination Government Department.

Education Department.

Industry, Trade and Job Department.

Health Department.

CODRONAR (Prevention and Treatment of Addictions)

Town Council Employment Agency.

Youth Province Agency.

Sports Province Agency.

Provincial Culture Agency.

External consultant.

The Team considers and studies each and every YRG that has been identified by the Brigade of Community Prevention. What is more, it considers the problem of the most relevant members of the group. Afterward, a strategy and program are developed ad hoc, tailored to the group needs. Once the program is prepared, budgeted and considered by the members of the group and the Police Chief of the area, its implementation starts.

Analyzing strengths and weaknesses of the program can be suggested that the main problems we are facing come from the governmental field. In that sense we have:

- Discontinuity in the development of some programs, delays and lack of experience in team working
- Fragmentation of the governmental policies
- Political manipulation of the YRG members
- Lack of sensitivity to the problem in the school system and the community that in many opportunities requires hardliner repressive policies instead of holistic prevention and attention.

Outcomes of the strategy

The Program “Education and Work” – started in 2004 as a program of education and labour training, targeted to young people of 15 to 23 years old in vulnerable situation – was originally designed by high school professors, police officers and community representatives of the area of Precinct 5 of the La Rioja Police. Now it is spread to all of the city of La Rioja, involving near 800 juveniles at risk.

Between 2004 and 2005 another group of 300 young assisted to the program. From that total,

- 174 (58%) were reinserted in the formal educative system and are currently studying;
- 73 (24.33%) received labour training and micro credits from the Industry, Trade and Job Department, that currently follows up their process.
- 34 (11.33%) were hired by the private industry and commerce.
- 19 (6.33 %) drop out the program.

No matter these encouraging outcomes, we prefer to consider the ongoing strategy just as one of reducing damage. Its general target is increased public safety by addressing key elements of disturbance, looking for processes where the interest and welfare of adolescents are promoted.

Similarities with some other experiences on interagency policies and complex adaptive systems

To sum up our findings while dealing with YRG in La Rioja, Argentina, we have surprisingly observed that not only YRG behave as complex adaptive systems but also a team of intergovernmental agencies dealing with the problem behaves in such a way.

The vicissitudes that we have had in the La Rioja’s experience are very similar to others, in the ones self organizing processes take place in the work of interagency teams. Meek (2005) argues that “Combined, the elements of self-organization and adaptation reveal a regional collaborative that seeks to learn and adapt to its environment. The following table summarizes the key activities of self-organization as illustrated by the collaborative:

- They learn to adapt to changes in circumstances
- There is no central controlling feature in the system
- There are many levels of organization in the system (ranging from individual to various collectives of individuals)
- They are constantly reconsidering and reorganizing themselves as they gain experience
- They are pattern seekers that learn from their experiences
- They anticipate the future
- They are always changing, an adaptive system is able to take advantage and learn from what the world around it is able to tell it

These aspects of the San Gabriel Valley Economic Partnership experience present valid conclusions, fully applicable to La Rioja’s experience.

At this point, we wish to draw attention to something that we have frequently encountered not only in scientific research but also in our field experience: dysfunctional complex adaptive systems – like bureaucracy, corruption, delinquency, or juvenile crime has a network pattern. This pattern is of distributed control that turns to be a truly immunological system that deals with threats from the environment responding and neutralizing them.

A sentence from Sun Tzu, in *The Art of War*, expresses this idea with demolishing precision: “The strongest strategic position is formless, it is a position that the adversaries cannot attack because it exists everywhere and nowhere”. These words written some 2400 years ago, show that oriental philosophy was aware of this aspect of systems. In our opinion, this is one of the most crucial points of a network structure: distributed control.

Conclusions

It has been absolutely useful for our work with youth at risk groups to consider them as complex adaptive self organizing systems. At the same time, if they are truly living systems that operate as dissipative structures, far from equilibrium and with the crucial characteristic of their capacity of learning, their consideration as autopoietic systems is just consistent with their deep nature.

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