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Utopian and dystopian ideological systems and unintended and adverse consequences

Utopian and
dystopian
ideological
systems

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Received 27 February 2020
Revised 13 April 2020
Accepted 27 May 2020

Abstract

Purpose – The purpose of this paper is to demonstrate mathematically the impossibility of achieving a utopian society. Demonstrate that any attempt to correct deviations from a hypothetical trajectory whose ultimate goal is the utopia, increasingly demands more work, including measures that lead to terror, which may even be absolute, leading to the horrible paradox that in seeking paradise hell is constructed.

Design/methodology/approach – Scientific tools that the authors have used are: the theory of the system linkage, alysidal algebra, kinematic theory and vector analysis.

Findings – Myths are the substrate of some complex systems of beliefs and utopia is its ultimate goal. The use of the combination of the theory of trajectories, belonging to the alysidal algebra, the theorem of unintended effects and kinematics theory provides an approximation to deviations suffering utopian ideological currents and their corrections.

Originality/value – This paper is a continuation of other previous papers developing the theory of complex societies.

Keywords Social systems, Utopia, Unintended effects, Trajectory, Responses, Alysidal sets, Dystopia, Forces, Gnorpsic functions, Totalitarianism

Paper type Research paper

Fundamentally, freedom and tyranny cannot be considered in isolation, although we observe them succeeding each other in time. It can clearly be said that tyranny suppresses and eliminates freedom – but, on the other hand, tyranny is only possible where freedom has been domesticated and has evaporated into vacuous concepts. (E. Jünger)

1. Introduction

In previous work (Nescolarde-Selva and Usó-Doménech, 2013a, 2013b, 2013c, 2013d; Nescolarde-Selva and Usó-Doménech, 2014a, 2014b; Nescolarde-Selva *et al.*, 2014; Usó-Doménech and Nescolarde-Selva, 2012, 2013; Usó-Doménech *et al.*, 2015; Nescolarde-Selva *et al.*, 2015; Nescolarde-Selva *et al.*, 2015), the authors have developed a theory of belief systems (ideologies) in complex social systems. These complex systems have been defined



Funding: This study was funded by the Ministry of Economic Affairs and Digital Transformation of the Spanish Government, under Project RTI2018-094653-B-C22.

Kybernetes
© Emerald Publishing Limited
0368-492X
DOI 10.1108/K-02-2020-0118

as deontic impure systems (DIS). In DIS [1] approach, the superstructure has been divided en two:

- (1) *Doxical superstructure (DS)* is formed by values in fact, political and religious ideologies and the culture of human society in a certain historical time.
- (2) *Mythical superstructure (MS)* also has been divided in two parts:
 - MS₁ containing the mythical components or primigenial bases (PBs) of the ideologies and cultures with the ideal values.
 - MS₂ containing ideal values and utopias that are ideal wished and unattainable goals of belief systems of the DS.

It is summarized these ideas in the following diagram (Figure 1):

There is a double distortion in the ideological phenomenon and concerning the opposition while it is the significance of the real object (*relative beings*) and the same reality of this object (*absolute beings*). Then, the relation between the structural base (SB) and superstructures (DS and MS) can consider from each one of the facts that have been isolated as components of the being in one or another symbolic system. It is a series of correspondences and each one can grasp a social reality.

The first of the superstructure PB has already been discussed in previous work, through the study of myths (Usó-Doménech and Nescolarde-Selva, 2012, 2013; Nescolarde-Selva and Usó-Doménech, 2014a, 2014b; Nescolarde-Selva *et al.*, 2015; Nescolarde-Selva *et al.*, 2015), considered as the background of complex belief systems. Being the utopian component of the ultimate goal of these complex belief systems, the authors think it is interesting to address this issue.

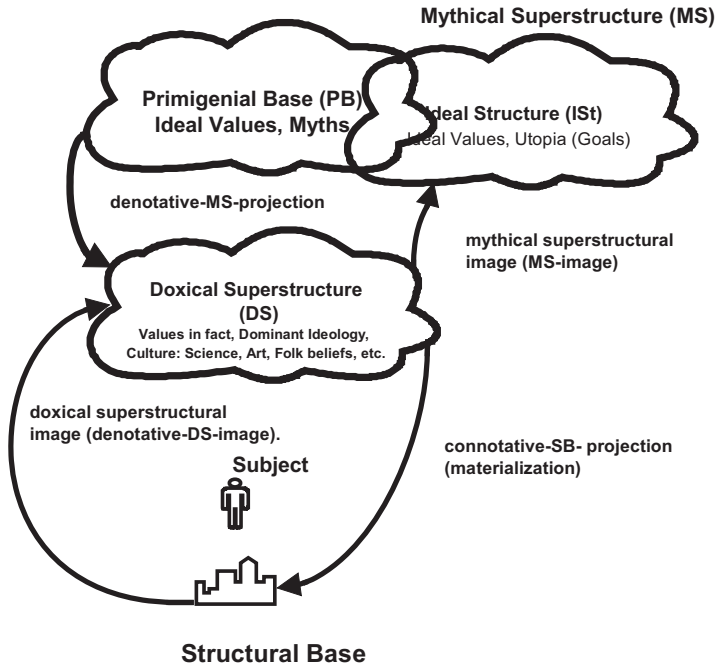


Figure 1.
SB and
superstructures

Utopias have existed, as remote historical times. As a rule, they have failed in their hypotheses and in their application. In most cases, they have led to economic and social disasters and to bloodbaths. In the natural sciences (physics, chemistry, etc.), hypotheses must be experimentally demonstrated. This does not happen in the field of sociology. However, social and economic change is at the heart of human history. In addition, generally, we can see that the same causes have the same (or similar) effects. All utopias, regardless of their size, have sought a golden age, a paradise on Earth, universal happiness and human liberation. However, all of them have opened hell, dystopias. Where is the mistake? One could say that it is in the application of their theory. However, we disagreed with that idea. An application is wrong if the axioms on which the theory is based are false. This makes us deduce that utopian axioms are totally wrong. In addition, on that, we base the following study.

The main objectives of this paper are:

- Demonstrate mathematically the impossibility of achieving a utopian society.
- Demonstrate that any attempt to correct deviations from a hypothetical trajectory whose ultimate goal is the utopia, increasingly demands more work, including measures that lead to terror, which may even be absolute, leading to the horrible paradox that seeking paradise hell is constructed.

The study could be approached with scientific tools different from those presented here such as information theory and thermodynamics (entropy). However, the authors have taken another path. The mathematical tools that the authors have used are: The theory of system linkage (Lloret-Climent *et al.*, 1998), alysidal algebra (Nescolarde-Selva *et al.*, 2012a, 2012b; Nescolarde-Selva and Usó-Doménech, 2013e; Usó-Doménech and Nescolarde-Selva, 2013; Usó-Doménech *et al.*, 2015), the kinematic theory (Leech, 1968) and vector analysis (Simons, 1970).

Unintended effects theorem (Usó-Doménech and Nescolarde-Selva, 2012, 2013; Usó-Doménech *et al.*, 2015) based in Gödel's incompleteness theorem, demonstrates that the goal of reducing reality to systemic concepts (ideological models) cannot be totally reached. For each constructed systemic conception, one of the two following things can happen to it:

- (1) Either some allowed responses are not produced or
- (2) Else some forbidden responses are produced.

What would it mean to say that reality is reduced to a given systemic conception? It would mean that the system produces as a response each allowed response of reality but also produces forbidden responses for the system. That is to say: any allowed response is produced from the system but that forbidden response is also produced.

We will call the forbidden responses produced by the system *unintended effects*. In the social sciences outcomes that are not the ones intended by a purposeful action are referred to as are unintended consequences (sometimes unanticipated consequences or unforeseen consequences). The concept has long existed but was named and popularized in the 20th century by the American sociologist Robert K. Merton. An example is a prohibition in the 1920s in the USA, originally enacted to suppress the alcohol trade. It drove many small-time alcohol suppliers out of business and consolidated the hold of large-scale organized crime over the illegal alcohol industry. As alcohol was still popular, criminal organizations producing alcohol were well funded, and hence also increased their other activities. Similarly, the war on drugs, intended to suppress the illegal drug trade, instead consolidates the profitability of drug cartels.

2. Thinking utopia

The first step on the stairway to utopia is to define what utopia is and thereby set forth ideal perfection in all aspects of existence. The ambiguity at the heart of the concept of utopia was evident in the text that inaugurated the modern tradition of envisaging ideal societies, Thomas More's (1516) *utopia*. For more, utopia was both a *no-place* and a *good place*. Utopia was a good place that existed nowhere, but it was also a good place that can never exist. Utopia was both a real critical ideal and a wildly impossible fantasy. To be *utopian* was either to be a radical visionary or a romantic naïf. For Marx, there was not too much utopian thinking but not enough utopian thinking. *The philosophers have only interpreted the world in various ways. The point, however, is to change it* [Marx, 1875 (1962)]. What institutions a socialist society should have, what problems these institutions are likely to generate, what solutions there may be for these problems: these utopian questions occupy a very small space in Marx's work, essentially confined to the marginal notes on the Gotha program.

In Western society, utopia accompanies myth as a shadow follows the object. Archaic societies periodically reimmerge themselves in *illo tempore* to recreate the world and to profit, once again by the prodigious energy that had gone into their own creation. Not being able to *repair* life, which is supposed to have degenerated, as the original outpouring of being, these societies feel compelled to return to the source and there to obtain the life-force sufficient to sustain them until there is time for the next ritual rejuvenation. Thus, myth is always the account of creation, but it can serve as a transcendental model only if it is itself *rejuvenated* (remembered as expressing real experience) at regular intervals. The dissolution of the myth and the degradation of its symbols constitute a long-drawn-out process in modern Western society and wherever its influence reaches. As we have said, however, the myth does not vanish; it undergoes a succession of metamorphoses until the *true story* turns into a *false story*. True and false do not refer here to story, but to the structure of the real, which may become obscured in exactly the same way as the content and meaning of a story may become veiled. The gradually degraded myth symbolizes the gradually obscured structure of reality. The design for the second reality may best be examined by drawing parallels with corresponding elements of the myth.

Archaic societies, adhering to the cycle of creation-degeneracy-recreation, put their faith necessarily in an immobile model, always *in the past* as looked at from the perspective of (degenerating) time. For Jews and Christians, however, God became *mobile*, a God who reconciled in himself eternity and participation in history. He accompanies mankind in their time-bound existence, so that time cannot degenerate, nor can its course be retraced to its source and begun anew. The end of the world occurs only once: time has become linear and irreversible. The collectivity has no rest before the eschaton. It seems archaic society understood the need for a periodic immersion in being so that time may remain related to its origin and recollection may not become too strenuous. This is not possible for Jews and Christians, consequently for modern man in Western society: the recovery of primordial time happens only once, at a time appointed by God, unknown to man; even this is no mere reconstitution of the cosmos, a recovery of innocence. It is a time of giving account, of selection and judgment. Hence, the many efforts in all parts of Western civilization to shorten the *profane time*, the time of history and thereby to relieve the tension that freedom relentlessly imposes, to lighten the terror of history with its risks. If myth insists on the recovery of ontological fullness, this cannot be said of the utopian design. Captive of the Judeo-Christian linear conception, the utopian designer cannot return to the beginning: not because he regards the biblical creation-story as true and unrepeatable, but because of his nostalgia for being propels him forward, rather than toward a past model. Moreover, the cosmos for him, as for modern man generally, has become opaque and mute, it transmits no

message, holds no cipher. He holds dear the images of paradise, but only as fragments of a coarse myth: freedom from work, nudity and sexual gratification, the destruction of time and of rationality. His utopia is not a link between a given community and its primordial model; the guarantee for it is not in *illo tempore* but in an undefined future, which remains to be constructed. Hence, the most important element of the myth, experience, is absent from utopia; in fact, its building blocks are the negations of the structure of the real. In the mind of the archaic purifier, the function is to restore pristine conditions to a thoroughly degenerated state that has fallen away from its archetypal existence. The utopian designer's task is no different; but as he is not reminded by an agreed-on periodicity that evil has accumulated to an intolerable degree, he must generate by himself, so to speak, the conviction that in-deed the time of redemption has come. According to this evaluation, mankind has fallen away from the ideal state of affairs, so that the restoration of innocence must take place forthwith. It is characteristic of the utopian designer to interrupt history and leap out of it into a stable state of perfection. It follows from this that the utopian shows no desire for reforming his society. Important millennial movements originate in times of stress, which are interpreted as an intolerable accumulation of evil and degeneracy from the ideal. Such as the archaic reformer, the utopian designer does not believe that mankind has fallen over time and that society in its profane historical existence can be *repaired*: it can only be abolished and another one constructed. The solution for the utopian designer is then to regard the creation of a second reality as a final solution, unlike the archaic reformed for whom immersion in archetypal existence was part of the cycle. He has no experience of it except the very indirect one of his own subjective evaluation about times having degenerated to an intolerable level. The substitute for the experience can only be the claim that he knows the mechanism of the process by which the first reality is transformed into second reality. The utopian designer's knowledge of the second reality and of the process leading to it is not knowledge but, rather, a quasi-historical or pseudo-historical insight derived over the centuries from various sources through a necessarily personal interpretation. The essential point is that the utopian designer wants to secure mankind against the avatars of history. The second reality is thus not simply a new historical period, which would be somehow different but in essence as incalculable as the first period through its own new aspects of personal actions and interactions; it is the sudden arrival at an ersatz-being, a state of religious enthusiasm, which is supposed to lift humanity from the level of profane occurrences onto that of the changeless and the sacred. The logic of the situation dictates that to harness the *terror of history* interpersonal relationships must be brought under tight control: education, marriage, parental ties, means of exchange, methods of production – all are regulated and worked out in minute detail. Not only are passions eliminated or at least neutralized but also microbes, sickness and accidents are unknown in utopia so that nothing may upset the perennial validity of the model. The objective of this utopian thinking must not be to specify all minute details of what a perfect society would look like. It must rather be:

- To formulate proposals for radical reforms to the present social order.
- To justify these by reference to normative principles or values to which on reflection one is willing to commit, combined with the best possible analysis of the root causes of the problems, which the proposals are meant to address.
- To subject the proposals to critical scrutiny, scanning relentlessly for all possible unintended effects, all to be evaluated in the light of explicit normative considerations.

Such utopian thinking is not meant to be value-neutral but it does not make social truth depend on valued judgments. Utopian thinking requires answers to many factual questions

about likely effects, about compatibility, about sustainability. It is legitimate for the choice of these factual questions to be guided by value judgments, but it is essential that the answers to these questions be shielded from the inference of both our interests and our values.

3. Typology of utopian systems

In [Walsby's \(1947\)](#) theory, ideologies have a taxonomical structure and every ideology belongs to one of the seven major ideologies. These are ranged in historical sequence according to their order of appearance, revealing the progressive development of human needs. The individual who identifies with the most recent of the principle ideologies thereby identifies with man's most advanced needs, but in doing so does not reject all the preceding ideologies listed in the taxonomical order of their appearance. He remains with them and they remain with him. [Walford \(1979, 1983a, 1983b\)](#) divides the major ideologies into three groups:

- (1) *Ediostatic group*: The ideologies in this group are:
 - *The protostatic ideology*: The principal features of the protostatic ideology area. Positive group identification. Negative cosmic identification. Economic individualism. Political collectivism. Negative intellectuality. Undifferentiated reality. Every volitional action of an individual, in any sphere, is influenced by the ideology he accepts. The protostatic ideology is at the same time a universal ideology in much the same sense as consumption is a universal necessity. It is *conservatism* and, under certain circumstances, *fascism Nazism and Islamic fundamentalism*. This group tends to identify exclusively with its own social unit (state, nation, country, umma) and to regard all outside that unit, the physical, social and human aspects of the environment with either complete indifference or, if it seems to be presenting a threat, then with undiluted hostility.
 - *The epistatic ideology*: This ideology justifies accepted practice. It does not aspire toward reforms but comes to terms with changes and innovations provided they strengthen the existing situation. People adhering to this ideology accept one of the religions, but at the same time recognize the right of other religions to exist; they are nationalists, but recognize the right of other nations to exist. In the political sphere, this is a *transition from the extreme right to conservatism*. In times of peace, he may uphold justice even though this obliges him to criticize his society or state. Such as the protostatic, he rejects intellectualism, but he is not as hostile to it.
 - *The parastatic ideology*: The sciences and particularly the physical sciences, now come to the fore in the struggle for survival and as a means of removing restrictions on freedom. This does not yet constitute the victory of intellectualism, however. The anti-intellectual approach continues to exist, though in a steadily weakening form. The sciences had born under the auspices of the parastatic ideology respect facts more than intellect, which is called upon to serve in the struggle for survival. The political embodiment of parastatism is *liberalism*. In it the assumption of multiplicity becomes the principle of faith, leading to the demand for universal suffrage.
- (2) *Ediodynamic group*: This awareness gave rise to the ediodynamic ideologies, which regard poverty, disease, cruelty and other social features as restricting man's freedom. According to this new approach, society is the target against, which or at least within which it is necessary to act to improve man's lot. The attitude toward the environment is positive and it is felt that the environment

should be preserved and defended. The person adhering to the dynamic ideology, on the other hand, will be prepared to mobilize others to defend nature and maintain peace with the neighbours, whoever they are, but at the same time will wish to fight to correct society and even to change it fundamentally. Here they are, collectivists, in economics and individualists in politics. Intellectualism should not be identified with intelligence. On the ideological left, not all the intellectuals are necessarily always intelligent. Each of the three ideologies in this group interprets the assumptions listed above in its own special way. The ideologies in this group are:

- *The protodynamic ideology*: Society is regarded as a complex whole that consists of classes connected to one another through interaction and not necessarily opposition. Nonetheless, *this is the first ideology, which is not based on positive identification with society and maintains that society needs to be structurally amended, not superficially improved. Political manifestation is social democracy.*
 - *The epidynamic ideology*: The epidynamic ideology, whose political manifestation is communism, takes negative identification with society still further. Society is depicted as the arena of conflict between hostile classes between, which there are unbridgeable contradictions regarding matters of principle. A revolution is an act of liberation. The same applies to all other aspects of reality; they all consist of contradictions and exist to develop in their own right.
 - *The paradyndamic ideology*: It is the ideology of anarchism. This takes the negative identification with society to its conclusion, as society's control of the individual is the principle limitation to his freedom. This control derives from the principle of authority, which the state uses as a mechanism of coercion. Consequently, it is necessary first to destroy the state. The principle underlying the new organization of society, which is necessary to ensure man's freedom, is the removal of all coercive institutions and the replacement of rule by the administration.
- (3) *Metadynamics group*: It does this by recognizing the fact that all the assumptions of all the previous ideologies are problems, which have to be dealt with, ad hoc and are not articles of faith. All the assumptions of all the ideologies need to be studied and examined, approached with a different attitude, namely that adopted by people toward assumptions with which they identify. The people who belong to this group try to understand the phenomenon known as ideology and thus defeat ideologies as factors limiting their freedoms.

In view of this classification, utopian systems can be categorized into the following groups:

- *Protostatic*: fascism, Nazism and islamic fundamentalism.
- *Epidynamic*: communism, anti-system movements, ecology, radical feminism.
- *Paradyndamic*: anarchism, anti-system movements, ecology, radical feminism.

4. Utopia, millenarianism and totalitarianism

Millenarianism has come to be the label for any movement or ideology, which is similar to the belief that, very shortly, the struggle between the forces of good and evil will come to a climax and the goodwill triumph and institute the reign of righteousness, when historical wrongs will be rectified and injustice and oppression will cease and those who profit from injustice and oppression will get what is coming to them. The righteous believers will play a crucial role in this drama, either by helping to defeat the forces of evil or by sharing in the

millennial reign or both. The appeal of such a belief to those who feel themselves the victims of injustice and oppression is manifest and, as a matter of historical fact, most people have been victims of injustice and oppression. Even beyond that, it can speak, very powerfully, to longings for a decisively better order of things, one without the all-too-evident imperfections of the present, one, moreover, untainted by connection with the present order. While there is, of course, no reason to believe in millenarian ideas, wishful thinking is a powerful and ubiquitous force in human affairs. Hobsbawm has some very astute observations on the explosive growth of social movements, their *periods of abnormally, often fantastically rapid and easy mobilization of hitherto untouched masses. Almost always such expansion takes the form of contagion* [...] (Hobsbawm, 1965, pp. 105-106). He then goes on to explain why millenarianism is highly suited to spreading ideas in this explosive manner: in short, why it is a sort of reproductive adaptation for memes, including, of course, the millenarian memes themselves.

Millenarianism is often associated with a *linear* view of history and, accordingly, with the so-called monotheistic or *Abrahamic* religions. Monotheistic traditions have introduced a new notion of time, and henceforth, of history. They all contain ideas about apocalyptic violence inaugurating the end of history and the definitive realization of a divine kingdom. The questions are, of course:

- whether such notions of time are limited to the so-called monotheistic traditions;
- whether it was really these traditions that introduced such notions or whether similar ideas were developed in other traditions; and
- whether the very category monotheistic traditions are adequate as an analytical category – or, rather, a normative theological notion.

The transition from the present world (perceived as corrupted and degenerate) to the utopian new world is often imagined as radical, definitive and violent. The just will be separated from the wicked by force and divinely ordained violence will play a central part in purifying and liberating the world from its corrupt and polluted elements. Hence, if the utopian promise is convincing, millenarian expectations can have great mobilizing potential and may be used as justification for real acts of violence. Significantly, there are several structural similarities between so-called *religious millenarianism* and other types of radical ideologies such as utopian nationalism, Maoism or Islamic fundamentalism. These similarities include notions of moral and racial purity, divine election and a lost glorious past that will be reestablished in the near future. It comes as no surprise, then, those in modern times millenarian belief systems often incorporate nationalist elements and vice versa.

To what extent are secular nationalism and totalitarianism related to religious millenarian movements? Or eco-sustainability (Nescolarde-Selva and Usó-Doménech, 2014b)? This question really has two components:

- Q1. The historical evolution of concepts and institutions, e.g. to what extent was, say, Soviet communism the result of modification of millenarian ideas?
- Q2. There is a question of dynamics, of causal mechanisms: even if the Bolsheviks really owed nothing to religious millenarian traditions, to what extent did the same mechanisms apply in both cases?

These are *entirely* separate questions, logically, though historians seem to confuse them habitually. Are there characteristics of a millenarian movement or its environment, which reliably predict whether it will survive as a straight-forward political movement or religious group or just die? There exists a subterranean world where pathological fantasies disguised

as ideas are churned out by crooks and half-educated fanatics for the benefit of the ignorant and superstitious. There are times when this underworld emerges from the depths and suddenly fascinates, captures and dominates multitudes of usually sane and responsible people, who thereupon take leave of sanity and responsibility. In addition, it occasionally happens that this underworld becomes a political power and changes the course of history (Cohn, 2006).

Millenarian ideas have qualities, which makes them tend to form the nuclei of narrative communities. The believers in the millenarian mythical story have a role to play in the story and so to accept the story is to feel that one is or should be, part of the community of believers. Non-believers are *not* part of the community (Nescolarde-Selva and Usó-Doménech, 2014a). However, in such situations, there is a natural tendency to think that everyone who is not part of the community is an *enemy* of the community and, as the real enemy is the adversary, they are (at least) the adversary's tools. It is hard enough to live peacefully with one's mundane enemies; but who could be asked to live peacefully with representatives of cosmic evil, especially when the final conflict is approaching rapidly? Accepting a millenarian story, then, entails joining a certain narrative community and often thus cutting oneself off from other communities. This carries very high costs, both emotionally and socially.

Millenarian movements are not sustainable, for the simple reason that the millennium is not now at hand and never has been. When this becomes apparent something has to give. Either the movement ceases to be millenarian or it collapses *qua* movement, leaving behind, perhaps, a few die-hard followers who keep finding reasons why the glorious day should be just a little more remote than they thought. Logically speaking, the failure of all previous millenarian expectations does not mean that they will *necessarily* be disappointed in the future. By definition, however, at most *one* of them could succeed.

The French Revolution proved that ideological movements could mobilize the public and, when willing to use violence, could indeed transform society. The industrial revolution and subsequent technology created vastly more powerful weapons – including some that were entirely new such as the airplane, missiles and nuclear weapons – that raised the potential for the bloodshed to new heights. Charles Darwin's theory of natural selection was perverted into social Darwinism and eugenics: racist pseudoscience that provided excuses to repress or eliminate entire groups of people. These events created a dangerous backdrop for the most sinister development of all. This was the notion that utopia was not just a perfect paradise to look forward to in the afterlife. Instead, utopia could be built right now, in this life. Such 20-21st centuries revolutionary and utopian ideologies as Anarchism, Marxism, Fascism, Nazism, communism and Islamic fundamentalism embraced this idea willingly – even enthusiastically – and used terror to implement it. These ideologies functioned as political religions, demanding fanaticism, commitment and sacrifice in return for an ultimate reward in this life rather than the next. Revolutionary ideology endeavors (or claims) to change a situation/system (e.g. Lenin in the former Soviet Union, Hitler in Germany, Castro in Cuba, the Ayatollah in Iran). However, once a system has been established, the same ideology can be used as an instrument to maintain the status quo. The Bolsheviks in the former Soviet Union and Ayatollah Khomeini claimed to move into new eras of change, prosperity and equality (Beetham, 1991); hence, the centrality of the role of the systematic use of power and myth-making in ideology. Ideology, says Lemberg, is synonymous with myth because both are *systems of ideas, which constitute and pilot the large power blocks of our society* (Eugen Lemberg cited by Wodak, 1989). By the *systematic exercise of power* is meant that an ideological movement or struggle is

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based on a definite line of action and is not random. Power is *the production of intended effects* [Russell, 1995 (1938)] or one's *ability to produce intended effects upon the world around them* (Beetham, 1991). Totalitarian leaders can be seen not as politicians but as mobsters, an organized conspiracy that uses criminal methods inspired by gangsters. They gain and maintain power by manipulating masses of people, often exploiting societies with many uprooted and alienated citizens such as existed in Europe after World war I.

Modern utopian ideological systems have the following features:

(1) Utopia

- World peace. There can only be true universal peace when every living person adheres to the ideology.
- Social equality. Communitarianism: all goods must be shared by all. No human being shall have more possessions than any other human being.
- No social stratification. All forms of social stratification should be dismantled and all forms of hierarchy abolished.
- Membership. Ideology replaces the family. Loyalty to the community should be above loyalty to family members, friends, etc.
- Ecology. There is an ideological and limited use of technology.
- Everyday life. A complete plan for every aspect of how people should live their lives and how society should function.
- Perfection. Ideology is the very definition of perfection and absolute truth. It cannot be contested in any way. It is the only proper basis for human activity.
- New order. The idea of the nation-state is impoverished. A World new order, based on ideology, is inevitable.

(2) Trajectory

- *World revolution*. International borders are an unnecessary invention created by the enemies of utopia (capitalists, imperialists, Zionists, etc.)
- *Capitalism, liberalism and democracy* are bad and must be destroyed.
- *Western economic, social systems and belief systems* that are based are the source of global inequality, division and exploitation of human beings and must be destroyed.
- *Generalized panic*. Fears of climate change can be used as a means to redistribute global wealth and promote ideology.
- *Violence*. Violence is necessary to impose the ideology and any infidel is a legitimate target.

(3) Corrective works

- *Absolute control*. Control of all aspects of life.
- *Intolerance*. No other belief system can be tolerated. The world must be governed by ideology and opposing views should be suppressed.
- *Terror*. Enemies, dissidents and the lukewarm should be intimidated, boycotted and eventually eliminated without mercy.

In addition, these regimes create fear and command allegiance through the use of "machines." These are not literally machines, but bureaucracies that carry out a set of deliberate, interrelated strategies. These include:

- *The cult of the leader or the cult of personality.* These make the dictator seem larger than life or superhuman. After Italy annexed Ethiopia in 1936, Mussolini's followers declared him to be a new god in human form. In the Soviet Union, long ovations after Stalin's speeches were common, as no one wanted to be seen as the first to stop applauding.
- *The Big Lie or deliberate distortions of the truth.* During the hundred flowers campaign, Mao Zedong seemed to promote free speech, then killed some half-million dissidents when they came out in the open.
- *Secret police.* An estimated 274,000 people worked with the East German secret police, the Stasi, from 1950 to 1989. When informers were added, this translated into one secret policeman for every 6.5 persons.
- *The media.* Radio, film and television were used to rewrite history and manipulate the masses. The Bolsheviks produced documentary films that made their October revolution seem much more dramatic and deadly than it was (a common joke was that more people were injured during filming than in the actual event).

5. Mathematical theory of trajectories

5.1 Images and projections

We will call ξ_D to the set of doxical superstructural signifiers [2].

Usó-Doménech and Nescolarde-Selva (2012): that is to say, the part of signs having been limited by the observer subject, when establishing the borders of the determinate ideological DS "covering" to determinate social structures. Let L_M be the set of possible MS individuals, that is to say, the totality of abstract mythical objects and relations belonging to MS (Usó-Doménech and Nescolarde-Selva, 2013). Let $I_{DS} = \{i_{DS}\}$ be the set of possible deontic superstructure individuals, that is to say, the totality of abstract objects and relations including within the DS impure deontical system (IDS) of a system Σ .

There is a mythical superstructural significance (MS-significance) denoted as s_{Σ}^M is a function that maps set ξ_D to a subset of L_M . MS-significances are the meaning in the mind of the subject of the elements belonging to the MS. MS-significance s_{Σ}^M has in ξ_D attribution respect the abstract relation R_i^k belonging to DS if $R_i^k \in s_{\Sigma}^M(\xi_D)$. Normally, the actor subject confuses IDS-significances and MS-significances.

Corresponding to some certain MS-significance s_{Σ}^M in MS, there is a single IDS-significance $s_{\Sigma}^{\vec{M}}$ to which we will call denotative-IDS-projection (IDS-projection) of the MS-significance s_{Σ}^M in the DS and that $s_{\Sigma}^{\vec{M}}$ for each ξ_{Σ} and for each $i_{DS} \in I_{DS}$, $i_{DS} \in s_{\Sigma}^{\vec{M}}(\xi_D)$, iff $i_{DS}^C \in s_{\Sigma}^M(\xi_D)$. The totality of IDS-projections on DS forms a subsystem of the systems of beliefs (among them the dominant ideology) that conform the DS. The IDS-projection of the MS on the DS (IDS) is for the subjects the primitive and subconscious explanation of the ideal and abstract DS. The dominant ideology has as a *foundation* a myth or residual ideology, which projects on the DS. For each IDS-significance s_D , there is a single MS-significance s_M that we will denominate so as a mythical superstructural image (MS-image) of s_{Σ}^M in MS and that $s_M(\xi_D) = \{R_i^k; s_D \in R_i^k\}$.

The part of the MS containing myths constitutes the PB of the DS (Figure 1).

A mythical superstructural image formed in the MS constitutes for the actor subject (considered here as a believer) the last goal of his belief, that is to say, the utopia. The totality of the MS-images reflected in the utopic part of the MS forms an ideal structure (*utopic structure* Ist) that constitutes the final and unattainable goal of all ideology.

The IDS-significance and its MS-image are equivalent, that is to say, that for ξ_D and for each abstract relation R_i^k , R_i^k has s_D in ξ_D , iff R_i^k has ε_M in ξ_D . This assertion leads us to $s_D \in R_i^k$ iff $R_i^k \in \varepsilon_M(\xi_D)$.

A subject S has or constructs a certain language L_M containing denotative-IDS-predicates (IDS-predicates) and mythical structural predicates (MS-predicates). Denotative-IDS-predicate (IDS-predicate) P^{DS} is that predicate belonging to L_M that express (names) one IDS-significance s_D . The mythical structural predicate (MS-predicate) P^M is that predicate belonging to L_M that expressing (names) one MS-significance ε_M .

Let us suppose that observer subject S names (in L_M) as v^* an abstract relation R_i^k , then:

- $P^{DS}v^*$ is true in ξ_D if the abstract relation R_i^k that v^* express in L_M , has s_D in ξ_D .
- P^Mv^* is true in ξ_D if the abstract relation R_i^k that v^* express in L_M , has ε_D in ξ_D .

The relation between one IDS-significance and its MS-image induces to the equivalence between the predicates of language L_M of the following way:

Property 1: If P^{DS} express s_D and if P^M express ε_M in L_M , then if v^* names one abstract relation R_i^k , $P^{DS}v^*$ is true iff P^Mv^* is true.

We may say it in the following way: For each ξ_D and for each abstract relation R_i^k if R_i^k there is in ξ_D then $R_i^k \in s_{\Sigma}^M(\xi_D)$. iff $R_i^k \in s_{\Sigma}^{\vec{M}}(\xi_D)$. Logically, the exposed idea is that $s_{\Sigma}^{\vec{M}}$ it is the only IDS-significance that agrees with MS-significance s_{Σ}^M in relation to all the possible existing abstract relations. Then, we may say that:

Property 2: In the language L_M if P^M express (it names) s_{Σ}^M and if P^{DS} express (it names) $s_{\Sigma}^{\vec{M}}$, then if v^* express (it names) an existing abstract relation, then P^Mv^* is true iff $P^{DS}v^*$

5.2 Systemic concepts

In this section, everything is in agreement with the theory of system linkage (Esteve-Calvo and Lloret-Climent, 2006; Lloret-Climent *et al.*, 1998).

A simple impure system-linkage $\Sigma = (M, R)$ is a semiotic system consisting of the pair formed by an impure object set M the elements of which are p -significances (relative beings) of entities belonging to reality (absolute beings) or certain attributes of these and a set of binary relations, such that $R \subset P(M \times M) = P(M^2)$. That is $\forall r \in R/r \subset M \times M$ being $r = \{(x_i, y_i) \in M \times M/x_i, y_i \in M\}$.

The simple empty system-linkage is defined by $\emptyset \equiv (\emptyset, \emptyset)$. Impure system-linkage, as a semiotic system, will be *closed* if the subject dispenses with the external environment and *open* if it does not do so.

An impure system-linkage defined within an impure object set M is a simple system $\Sigma = (M, R)$ or a finite union of simple impure systems-linkage $\Sigma = \bigcup_{i=1}^n \Sigma_i$ such that Σ_i are simple systems. It is denoted as $\Sigma \equiv (M, R)$ such that $R \subset P(\bigcup_{i=1}^n M_i^2)$.

Note 1: An impure system-linkage shall be open iff the subject recognizes the existence of an external environment.

A variable x is the p -significance of an absolute being or of some of their specific attributes.

Let M be an impure object set formed by p -significances of absolute beings or their attributes. So that:

$$\begin{aligned} \coprod &= \{M\} \cup \{M \times M\} \cup \{M \times M \times M\} \cup \dots \cup \{M \times M \times M \times \dots \times M\} \\ &= \{M\} \cup \{M^2\} \cup \{M^3\} \cup \dots \cup \{M^n\} \end{aligned}$$

If $\text{Card } M = m$ then $\text{Card } \coprod = m + m^2 + m^3 + \dots + m^n = \frac{m(m^n - 1)}{m - 1}$

Let $\Sigma = (M, R)$ be an impure system linkage.

If $(x, y) \in r$ whereby $r \in R$, we say that x directly influences y . Thus, we assume that R is a set of relations between elements of M . R is formed of interactions with determination between said elements. Real determination is causative determination and causative interactions may be of two classes: transactions, energy and matter changes and relationships, which are indirect consequences of transactions.

If $x, y \in M$, we say that x exerts an indirect influence over y when the elements $x_1, x_2, \dots, x_n \in M$ and the relations $r_1, r_2, \dots, r_{n+1} \in R$ exist and where n is a positive integer number such that $(x, x_1) \in r_1, (x_1, x_2) \in r_2, \dots, (x_{n-1}, x_n) \in r_n, (x_n, y) \in r_{n+1}$.

The input-output structural function is the function $f_M: M \rightarrow P(M)$ defined as $\forall x \in M, f_M(x) = M_x \in P(M)$; where M_x is a set defined as $M_x = \{y \in M / \exists r \in R, (x, y) \in r\}$

Let $x \in M$ be. Trajectory [3], denoted as $\text{Trf}_M(x)$, is the element in $P(M)$ formed of $f_M^n(x), \forall n \in N$ of x . In other words, it will include all the direct and indirect influences attained from x .

Let $A \in P(M)$. The element in $P(M)$ formed of $f_M^n(x), \forall n \in N, \forall x \in A$ is the trajectory of A , denoted as $\text{Trf}_M(A)$. In other words, it will include all the direct and indirect influences attained from elements in A . By its very nature, each $\text{Trf}_M(x)$ is an invariant set [4] and, moreover, each set covers [5] itself.

Let $x, y \in M$ be. Both variables are independent of each other when neither is in the other's trajectory (i.e. $x \notin \text{Trf}_M(y) \wedge y \notin \text{Trf}_M(x)$). In other words, neither of the variables directly nor indirectly influences the other.

Let $A, B \in P(M)$ be. Two subsets are independent of each other when they are disjoint and when each pair of elements of A and B , respectively, are independent of each other (i.e. $\forall x \in A, x \notin \text{Trf}_M(y), \forall y \in B \wedge \forall y \in B, y \notin \text{Trf}_M(x), \forall x \in A$). In other words, the variables in each set do not influence each other, whether directly or indirectly.

Let $A, B \in P(M)$ be. B is in the trajectory of A (i.e. $B \subseteq \text{Trf}_M(A)$) when $\forall y \in B, \exists x_y \in A / y \in \text{Trf}_M(x_y)$. This means that each element in B is directly or indirectly influenced by some element in A .

The base of the impure system S – denoting it as B_S – is the element of $P(M)$ that verifies that:

- The elements in B_S are all independent of each other.
- $\forall x \in B_S, \exists r_S \in R / (x, x \in r_S \wedge \forall z \in M, z \neq x, (z, x) \in r, \forall r \in R)$. The elements in B_S influence each other and are not influenced by elements from M .
- Sets $\text{Trf}_M(x)$ are all independent of each other $\forall x \in M$. These are sets associated with each variable.
- $M = \cup \text{Trf}_M(x)$

Let B_S be a base of S . Set $P_S = \{\text{Trf}_M(x), \forall x \in B_S\}$ is a basic partition of S .

5.3 Alysidal algebra concepts

In this section all is in agreement with the theory alysidal algebra (Nescolarde-Selva *et al.*, 2012a, 2012b; Nescolarde-Selva and Usó-Doménech, 2012, 2013e; Usó-Doménech and Nescolarde-Selva, 2012, 2013; Usó-Doménech *et al.*, 2015).

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Between two variables x_1 and x_2 belonging to an impure object set M , there may be multiple relations $r_1, r_2, \dots, r_m$ of different physical and informational characteristics, etc.

The sheaf of relations, denoted as h_{ik} is the multiple relations existing between two variables x_i and x_k , $x_i, x_k \in M$. A sheaf may be *monorelational* if there is a single relation between two variables. It shall be *bi-relational* if there are two and *n-relational* if there are n relations. The *empty sheaf* indicates the non-existence of relations between two variables.

Let $\mathcal{K}$ be the set of all the possible binary relations, does not matter as it is the nature of the relation. To this set $\mathcal{K}$ we will call *space of relations*. A relational set R is $R \subset \mathcal{K}$, that is to say $\forall r_i \in R/r_i \in \mathcal{K}$. The relations form *tuplets* thus and a *set of tuples* $\coprod$ is:

$$\coprod = \left\{ \begin{array}{l} L_1 = \{x_0, x_2, \dots, x_{n-1}\} = \{l_0^1, l_1^1, \dots, l_{n-1}^1\} \\ L_2 = \{(x_0, x_0), (x_0, x_1), \dots, (x_{n-1}, x_{n-1})\} = \{l_0^2, l_1^2, \dots, l_{n^2-1}^2\} \\ L_3 = \{(x_0, x_0, x_0), (x_0, x_0, x_1), \dots, (x_{n-1}, x_{n-1}, x_{n-1})\} = \{l_0^3, l_1^3, \dots, l_{n^3-1}^3\} \\ \dots \dots \dots \\ L_n = \left\{ \left(\begin{array}{c} \leftarrow \dots \dots n \dots \dots \rightarrow \\ x_0, x_0, \dots, x_0 \end{array} \right), \dots, \left(\begin{array}{c} \leftarrow \dots \dots n \dots \dots \rightarrow \\ x_{n-1}, x_{n-1}, \dots, x_{n-1} \end{array} \right) \right\} = \{l_0^n, l_1^n, \dots, l_{n^n-1}^n\} \end{array} \right\}$$

That is:

$$\coprod = L_1 \cup L_2 \cup \dots \cup L_n = \bigcup_{i=1}^n L_i$$

The super index indicates the number of variables, which form a tuple and the sub-index is a natural number where the relation between the variables that form the tuple is codified.

Given a relation R , the inverse relation denoted as R^{-1} , is relation $R^{-1} \subseteq M \times M$ defined by $\forall x_i, x_j \in M, (x_j, x_i) \in R^{-1} \leftrightarrow (x_i, x_j) \in R$.

We define a *space of sheaves* such as:

The inverse of a sheaf h_{ij} indicated h_{ji}^{-1} is obtained investing each one of the pairs that belong to h , thus: $h_{ji}^{-1} = \{(x_i, x_j)/(x_j, x_i) \in h_{ij}\} \wedge \{x_i h_{ij} x_j \leftrightarrow x_j h_{ji}^{-1} x_i\}$.

There is a clockwise sheaf (sheaf of direct relations) denoted $d\text{-}h_{ij}$ when the p relations forming the sheaf go from element x_i to element x_j . It is represented as $x_i \Rightarrow^{d-hij} x_j$

There is a nonclockwise sheaf (inverse sheaf or sheaf of inverse relations) denoted as $l\text{-}h_{ij}$ when the p relations forming the sheaf go from element x_j to element x_i . It is represented as $x_i \Rightarrow^{l-hij} x_j$

There is a reciprocal relation between two elements x_i and x_j belonging to set M when the relation is to time a clockwise and nonclockwise relation.

There is reciprocal sheaf denoted as $r - h_{ij}$ when the p -relations forming the sheaf is going from element x_i to element x_j and going from element x_j to element x_i . It is represented as $x_i \leftrightarrow^{r-hij} x_j$ and such that $d - h_{ij} \cap l - h_{ij} = \{r_{ij}\} = r - h_{ij}$.

Between two elements x_i and x_j can exist *sheaves* of complementary form $d - h_{ij}$, $l - h_{ij}$ and $r\text{-}h_{ij}$. Within the same sheaf, there can exist independent and dependent relations.

An independent relation is one that it does not depend on other relations existing in the same sheaf.

A dependent relation is one that depends on other existing relations in the same sheaf and so that $r_i = f(r_1, \dots, r_n)$ and $(r_1, \dots, r_n)$ being independent from itself.

A dependent relation that comes conditioned by other independent relations is called a generated relation and the independent relation that they condition we will call a generating relation. An independent relation, that is not generating is called a singular relation.

Property 1: The generated relations are independent to each other.

The freeway between two elements x_i and x_j denoted as Φ_{ij} is the set constituted by the sheaves $d - h_{ij}$, $l - h_{ij}$ and $r - h_{ij}$. It is represented as $x_i \Longleftrightarrow x_j$. Therefore, in a freeway Φ_{ij} there will be three directions: a clockwise sheaf, a reciprocal sheaf and an anti-clockwise sheaf.

Note 1: Freeways φ_{nm} are feedbacks loops.

Note 2: $M = L_1 = H_1 = \Phi_0 \subseteq \mathfrak{S}$ being $\mathfrak{S}$ the lexicon [6]. That is to say, the impure set object is simultaneously a set of empty relations, empty sheaves and empty freeways.

Note 3: An inverse freeway does not make sense.

A chain φ_i^k will be an abstract chain, the elements or variables of which are related by means of freeways, that is, $\varphi_\omega^k = x_i \Longleftrightarrow x_j \Longleftrightarrow \dots \Longleftrightarrow x_\omega$.

- We represent the chain as φ_i^k , where the subscript i represents the number of constituent variables (p -significances) of the chain and the supraindex k an arbitrary number of identification.
- In every chain φ_i^k there will be a number of freeways equal to the number of variables, which are components of the chainless one, that is, if the number of variables, which are components of the chain is n , the number of freeways will be $n - 1$.
- Each constituent variable will be a *node*.
- Each freeway that leaves from a node will form a *branch*.
- The initial node will be the *root node*.
- The terminal will be an *apical node*. A chain can have a single node root but several terminals.
- The chain having more nodes will be called a *trunk* and its terminal node will be the *top apical node*.
- Chains whose root node is connected by means of a freeway with the apical node are *cyclical chains*.

An alysidal set [7] is a set whose elements are chains formed by relative beings united by freeways of inferential relations and/or transactions. Alysidal sets have the following properties:

- A relative object (p -significance) considered a mono chain, that is to say, an element of an alysidal set.
- An alysidal set can be considered as a special class of system in which their elements (chains) are not interrelated.
- Each alysidal element can be considered either as a system in itself or as a subsystem.
- The emptiness alysidal set $\emptyset$ exists.
- For an alysidal set A_{ab} , the difference $U - A_{ab}$, where U is the universe of discourse, is called the complement of A and it is denoted by A_{al}^C . Thus, A_{al}^C is the set of everything, that is not in A_{al} .
- An ordered pair is a pair of alysidal elements with an order associated with them. If alysidal elements are represented by φ_i^k and φ_j^l , $i \begin{cases} = j \\ \neq j \end{cases}, k \neq l$, then we write the ordered pair as $(\varphi_i^k, \varphi_j^l)$.
- Two ordered pairs $(\varphi_i^k, \varphi_j^l)$ and $(\varphi_n^u, \varphi_m^v)$ are equal if and only if $(\varphi_i^k = \varphi_n^u)$ and $(\varphi_j^l = \varphi_m^v)$.

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- Let A_{al} and B_{al} be two alysidal sets. The set of all ordered pairs $(\wp_i^k = \wp_j^l)$, where $\wp_i^k$ is an element of A_{al} and $\wp_j^l$ is an element of B_{al} , is called the Cartesian product of A_{al} and B_{al} and is denoted by $A_{al} \times B_{al}$.

If alysidal element $\wp_i^k$ of A_{al} has n nodes and the alysidal element $\wp_j^l$ of B_{al} has m nodes, the space of possibilities of coupling will be $(n \times m)$. Nevertheless, in this space of possibilities a single one “is chosen,” as much by the alysidal element $\wp_i^k$ as by the $\wp_j^l$. The other possibilities are rejected, however, if alysidal element $\wp_j^l \in B_{al}$ “knew” a certain node it must make a coupling. Therefore, we will have to define a function of knowledge or gnorpisic (of the Greek $\gamma\nu\omega\rho\psi\alpha$: to know) associated to the connection between alysidal element $\wp_j^l \in A_{al}$ and the $\wp_j^l \in B_{al}$.

A gnorpisic function denoted as $\omega^{m_j} \underset{n_i}{f} \wp_i^k \rightarrow \wp_j^l$ is the function that determines that node n_i (departure node) of alysidal element is connected with node m_j (arrival node) of alysidal element $\wp_j^l \in B_{al}$.

If the connection of n_i (departure node) is only with a single arrival node m_j , the function will be monognorpisic and we denote as $1^{m_j} \underset{n_i}{f} \wp_i^k \rightarrow \wp_j^l$. If the connection of n_i (departure node) is with two arrival nodes m_j, m_k , the function will be bignorpisic and we denote as $2^{m_j, m_k} \underset{n_i}{f} \wp_i^k \rightarrow \wp_j^l$. If the connection of n_i (departure node) is only with three arrival nodes m_j, m_k , the function m_l will be trignorpisic and we denote as $3^{m_j, m_k, m_l} \underset{n_i}{f} \wp_i^k \rightarrow \wp_j^l$. If the connection of n_i (departure node) is with many arrival nodes $m_j, m_k, m_l, \dots, m_\omega$ the function will be polignorpisic and we denote as $\omega^{m_j, m_k, \dots, m_\omega} \underset{n_i}{f} \wp_i^k \rightarrow \wp_j^l$. Subindex n_i indicates the departure node, supraindex m_j the arrival node and supraindex ω the order of coupling:

- Each pair of connected alysidal elements will have, therefore, one associate gnorpisic function.
- The gnorpisic function will depend on modal deontic components such as prohibition, obligation, permission and choice.

A simple multi relational impure system $\sum_S$ is defined as:

- the pair formed by set object M and a set of n -tuple relations $R \subseteq \prod$ and we denote as $\sum_S = (M, \mathfrak{R})$
- the pair formed by the object set M and a set of n -tuple relations $\mathfrak{R} \subseteq \prod$ and that we denote as $\sum_S = (M, \mathfrak{R})$ [8] with $\mathfrak{I}$ being the lexicon, such that $\mathfrak{I} = \{\Xi\} \wedge \{\text{notions, terms: variables and constants, predicates and verbal forms and logical constants}\}$, being $\Xi = M = \{l_0^1, l_1^1, \dots, l_{n-1}^1\} = \{x_i\}_{i=1, \dots, n}$ an s -impure set and $\mathfrak{R}$ the set of freeways.

Note 4: In the first case the Lexicon defines a semi-ontic simple complex-multirelational-impure system. In the second case, it defines a semi-ontic simple complex-multirelational-impure system.

For our purposes, we have used the second option.

5.4 The impure systems concepts

A complex multirelational impure system defined within an impure set object M is a simple multirelational impure system $\sum_S = (M, \mathfrak{R})$ or a finite union of simple multirelational impure systems $\sum_U = \bigcup_{i=1} (\sum_S)_i$, such that $(\sum_S)_i$ are simple multirelational impure systems.

An n -complex multirelational-impure system defined within a Lexicon $\mathfrak{L}$ or simply an impure system is a simple complex-multirelational-impure system $\sum_{CS} = (\mathfrak{L}, \mathfrak{R})$ or a finite union of simple complex-multirelational-impure systems $\sum_{\cup} = \bigcup_{i=1}^n (\sum_{CS})_i$ and such that $(\sum_{CS})_i$ are complex-multirelational-impure systems.

In an impure system $\sum = (M, \mathfrak{R})$, the structure is considered hierarchic iff no subset of M is a loop.

In the same way, as in the impure system, subject S could perceive it as closed or open, according to whether or not it ignores the existence of an environment H theoretically external to it. We suppose the existence of both environments H' and H'' (Lloret-Climent *et al.*, 2001, 2002; Nescolarde-Selva *et al.*, 2012a, 2012b; Nescolarde-Selva and Usó-Doménech, 2012, 2013e; Patten, 1978, 1982; Usó-Doménech *et al.*, 2002; Usó-Doménech and Mateu, 2004; Usó-Doménech and Nescolarde-Selva, 2012, 2013; Usó-Doménech *et al.*, 2015). Nevertheless, although subject S conceives how something is chaotic, anarchical and not structured they are also structures. Therefore, we can consider how stimuli (inputs) that are clockwise sheaves (d-sheaves) coming from some alysidal element belonging to some alysidal set exist in stimulus environment H' .

Let $\sum = (M, \mathfrak{R})$ be an impure system.

We will call $A_{al}^{H'}$ the alysidal set belonging to H' and ${}^{H'}\wp_i^k \in A_{al}^{H'}$ a departure alysidal element, h_{ij} is a stimulus sheaf and $\wp_j^l \in \Sigma$ the arrival chain. Let $\omega^{m_j} f_{n_i}^{H'} \delta_i^k \rightarrow \wp_j^l$ be the gnorpsic function. Then:

- A sheaf is a stimulus (input) sheaf iff:

$$\left\{ \exists {}^{H'}\wp_i^k \in A_{al}^{H'}, \exists \wp_j^l \in \Sigma / \omega^{m_j} f_{n_i}^{H'} \delta_i^k \rightarrow \wp_j^l \right\}$$

- A variable x is an entrance variable iff:

$$\left\{ \exists x \in \wp_j^l \exists h_{ij} \omega^{m_j} f_{n_i}^{H'} \delta_i^k \rightarrow \wp_j^l \right\}$$

We can consider how responses (outputs) that are clockwise sheaves (d-sheaves) coming from some chain belonging to the impure system to some alysidal set being in response environment H'' . We will call $B_{al}^{H''}$ the alysidal set belonging to H'' and ${}^{H''}\wp_i^k \in B_{al}^{H''}$ an arrival alysidal element, h_{ij} is a response sheaf and $\wp_j^l \in \Sigma$ the departure chain. Let $\omega^{m_j} f_{n_i}^{H''} \delta_i^k \rightarrow \wp_j^l$ be the gnorpsic function:

- A sheaf is a response (output) sheaf iff:

$$\left\{ \exists \wp_i^k \in \sum, \exists {}^{H''}\wp_j^l \in B_{al}^{H''} / \omega^{m_j} f_{n_i}^{H''} \delta_i^k \rightarrow \wp_j^l \right\}$$

- A variable x is an exit variable iff:

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$$\left\{ \exists x \in \wp_i^k \exists h_{ij} \overset{m_j}{\omega} f_{n_i}^{H'} \wp_i^k \rightarrow \wp_j^l \right\}$$

- A variable x_i is an internal variable iff:

$$\left\{ \exists x_j \in M, \exists h_{ij} \in H / \left(x_i \xrightarrow{h_{ij}} x_j \right) \in H \right\} \wedge \left\{ \exists x_k \in M, \exists h_{ki} \in H / \left(x_k \xrightarrow{h_{ki}} x_i \right) \in H \right\}$$

-
- The structural entrance-exit is the function $f_{\mathfrak{S}}: \mathfrak{S} \rightarrow P(H)$ such that for the whole subset:

$$\Xi = \left\{ l_{k1}^1, l_{k2}^1, \dots, l_{kn}^1 / ki \in \{0, 1, \dots, n-1\} \right\} \subseteq \mathfrak{S}$$

$f_{\mathfrak{S}}(\Xi) = \mathfrak{S}_I \in P(H)$ being $\mathfrak{S}_I$ the set of all the sheaves existing between $l_{k1}^1, l_{k2}^1, \dots, l_{kn}^1$.

- The structural exit-response function is the function $g_{\mathfrak{S}}: \mathfrak{S} \rightarrow P(\mathfrak{S})$ such that for the whole subset $A = \left\{ h_{m1}^k, h_{m2}^k, \dots, h_{mn}^k \right\} \subseteq P(\mathfrak{R})$ is $g_{\mathfrak{S}}(\mathfrak{A}) = \mathfrak{S}_I^* \subseteq \mathfrak{S}$ with $\mathfrak{S}_I^*$ being the set formed by all the elements l_{k1}^1 such that between them the sheaves $h_{m1}^k, h_{m2}^k, \dots, h_{mn}^k$ exist.

If $\Xi = \left\{ l_1^0, l_2^0, \dots, l_i^0 \right\} \subseteq \mathfrak{S}$ the following is fulfilled:

$$(f_{\mathfrak{S}} \cup g_{\mathfrak{S}})|_{\mathfrak{S}_I(\Xi)} = \left\{ l_k^0 \in \mathfrak{S} / \exists h_1, h_2 \in \mathfrak{R}; \left(\Xi \Rightarrow l_k^0 \right) \in h_1 \vee \left(l_k^0 \Rightarrow \Xi \right) \in h_2 \right\}$$

That is $(f_{\mathfrak{S}} \cup g_{\mathfrak{S}})|_{\mathfrak{S}_I(\Xi)} f_{\mathfrak{S}}|_{\mathfrak{S}_I(\Xi)} \cup g_{\mathfrak{S}}|_{\mathfrak{S}_I(\Xi)}$

The structural functional impure system $\sum = (\mathfrak{S}, \mathfrak{R})$ is the function $F: \mathfrak{S} \rightarrow P(H)$ defined as:

$$F(\Xi) = \begin{cases} f_{\mathfrak{S}}|_{\mathfrak{S}_E(\Xi)} \\ f_{\mathfrak{S}}|_{\mathfrak{S}_I(\Xi)} \cup g_{\mathfrak{S}}|_{\mathfrak{S}_I(\Xi)} \\ g_{\mathfrak{S}}|_{\mathfrak{S}_S(\Xi)} \end{cases}$$

$$\begin{aligned} \forall l_i^0 \in H, i = 1, 2, \dots, n; \quad F_H \left(l_i^0 \right) &= H_{l_i^0} \in P(H) \quad H_{l_i^0} \\ &= \left\{ m_i^0 \in H / \exists h_i \in \mathfrak{R}, \left(l_i^0, m_i^0 \right) \in h_i \right\} \end{aligned}$$

Given a sheaf $h \in H$, the structural entrance-exit function associated with the sheaf $h \in \mathfrak{R}$ is the function $f_r: \mathfrak{S} \rightarrow P(H)$ defined as $f_r(\Xi) = A \in P(H); A = \left\{ l_k^0 \in \mathfrak{S} / \exists h \in \mathfrak{R} \left(\Xi \Rightarrow l_k^0 \right) \in h \right\}$.

Let $h_{i-1}^i \in H, i = 1, 2, \dots, n$ be. The element in $P(H)$ formed of $F_{\Xi}^n \left(h_{i-1}^i \right), \forall n \in N$ is the trajectory of h_{i-1}^i , denoted as $Trf_{\Xi} \left(h_{i-1}^i \right)$.

By its own nature, all DIS will be AIS but all AIS will not be DIS. Let $\coprod = \coprod_P \cup \coprod_{P_h}$ exist and let $\coprod_P$ be the space of allowed abstract tuplelets and $\coprod_{P_h}$ be the space of forbidden abstract tuplelets. Let $l_i^k \in \coprod, i = 0, 1, 2, \dots, n-1; k = 1, 2, \dots, n$ be any tuplelet. $Pl_i^k \in \coprod_P$ will be an allowed tuplelet. $Pl_i^k \in \coprod_{P_h}$ will be a forbidden tuplelet. We considered above the

difficulty of defining allowed and forbidden sheaves and/or freeways. As a sheaf tolerates the existence of multiple relations, some of them can be forbidden. Within the space of relations $\mathcal{K}$, we will find allowed and forbidden relations. Then, $\mathcal{K} = \mathcal{K}_P \cup \mathcal{K}_{Ph}$, where $\mathcal{K}_P$ is the space of allowed relations and $\mathcal{K}_{Ph}$ is the space of forbidden relations. We will consider a sheaf allowed the one that has, at least, one allowed relation, this is to say $\exists r_i \in h_m^n$ so that $r_i \in \mathcal{K}_P$, then Ph_m^n .

A multirelational DIS or simply DIS designated as $\Sigma = (\mathfrak{F}, \mathfrak{R}_P)$ is an impure system, whose multirelational set will comprise sheaves or permitted chains that is, $(Ph_m^n) \wedge (Pl_i^k)$ [9].

Unintended Effects Theorem (Usó-Doménech *et al.*, 2015; Nescolarde-Selva *et al.*, 2018), based in Gödel's incompleteness theorem, demonstrates that two types of response occur: responses allowed by the system and forbidden responses, i.e. unintended effects. Let L be the response set formed by sheaves and L_A and L_F be the sets of allowed and forbidden responses, respectively, such that $L = L_A \cup L_F$. $L_A = \{h_{i-1}^i\}_{i=1,2,\dots,n}^A$;

$$L_F = \{h_{i-1}^i\}_{i=1,2,\dots,m}^F.$$

Let $s(x,y)$ be a virtual dimension, which we call the space or the path of the system and t be the time of the system. Consider the ideal case of the absence of adverse effects, i.e. $L_F = \emptyset$. In this case, we would have an ideal trajectory $Trf_{\Xi}^A(h_{i-1}^i)$. In the other limiting case where the system only produced unintended effects, i.e. $L_A = \emptyset$, we would have a completely adverse trajectory $Trf_{\Xi}^F(h_{i-1}^i)$. We will represent these ideal and completely adverse trajectories in a three-dimensional graph (Figure 2).

Theoretically, there is an infinite number of possibilities between these limiting cases, i.e. $Trf_{\Xi}(h_{i-1}^i) = Trf_{\Xi}^A(h_{i-1}^i) \cup Trf_{\Xi}^F(h_{i-1}^i)$. What determines whether the resulting trajectory drifts back to either of the two limiting cases? The number of sheaf responses of

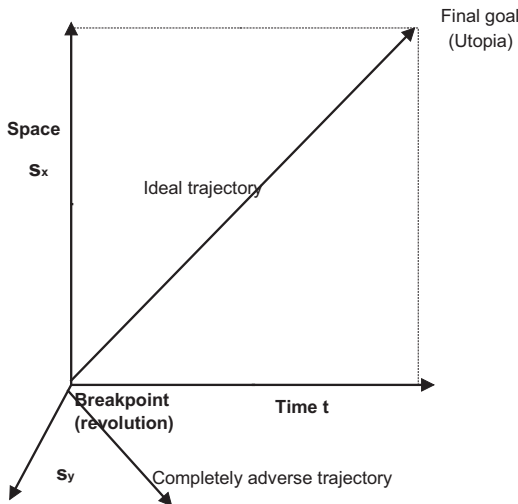


Figure 2.
Ideal and completely
adverse trajectories

one or another kind and their intensity. Intensity is defined as (Nescolarde-Selva and Usó-Domènech, 2013e; Usó-Domènech and Nescolarde-Selva, 2012):

The degree of relational intensity of a relation r between two p -significances (relative beings) denoted as I_r is a real number $I_r \in [0,1]$ that it measures, by direct or indirect procedures, the intensity or forces of a relation.

Note 5: If $I_r = 1$ we will call rigidity with respect to a relation r and if $I_r = 0$ we will call independence with respect to this relation.

The degree of intensity of a sheaf h_{ij} formed by n independent relations, denoted as I_h , is

$$\sum_{i=1}^n (I_r)_i$$

the real number $I_r \in [0,1]$ so that $I_h = \frac{\sum_{i=1}^n (I_r)_i}{n}$.

Note 5: If $I_h = 1$ we will call the sheaf rigid and if $I_h = 0$ we will call the sheaf flexible.

The intensity of the sheaf response will be called the force and denoted as F_h .

Force F_h is the influence that causes the DIS to undergo a given change, either concerning its movement or direction (trajectory). Force F_h has both magnitude and direction, making it a vector quantity. The cause of this force is implicit in definition 40. The existence of two forces, the ideal and adverse forces, produces deviation from the ideal trajectory, creating a real trajectory that moves away indefinitely from its goal (Figure 3).

The angle of deviation from the ideal trajectory is α and the angle of deviation from the completely adverse trajectory is β . Thus, $\tan \beta = \frac{s_U}{t}$ where s_U is a distance, which will be called utopian distance:

- H1. Unintended responses depend on the relationships (or sheaves) between system variables (nodes).
- H2. The greater the rigidity of the relationships (or sheaves), the more intense the unintended responses (forces).

For a better understanding of our theory, we have shown it in Figure 4:

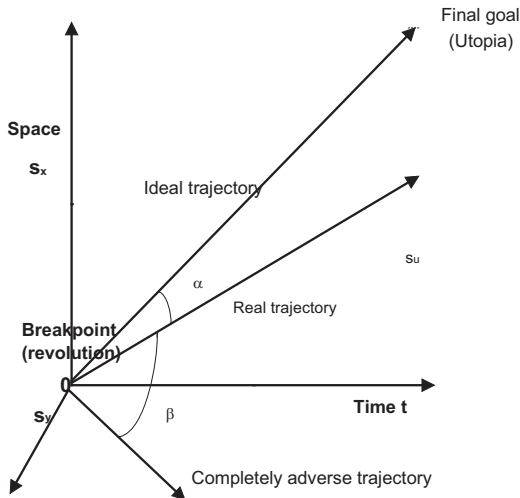


Figure 3.
Real trajectory

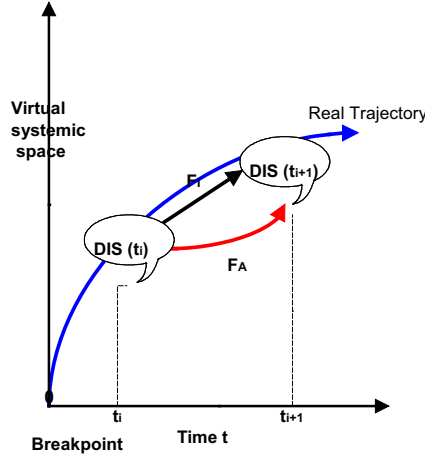


Figure 4.
The motion of the DIS

where F_I and F_A are the ideal and adverse forces, respectively and s is a virtual space, i.e. an imaginary distance between the breakpoint and the ultimate objective (utopia).

6. Kynematics approach

In a previous study (Nescolarde-Selva and Usó-Doménech, 2013e), the existence of a virtual volume was defined for the DIS. Similarly, we must imagine the existence of a virtual mass m_Σ belonging to the DIS. This mass is the number of DIS nodes, considered an alysidal set [10].

Consider the DIS as a single particle. According to classical mechanics, the motion of a particle is represented by a vector equation of motion of the type:

$$\vec{F} = \frac{d}{dt} \left(m_\Sigma \frac{d\vec{r}_\Sigma}{dt} \right) \quad (1)$$

where $\vec{r}_\Sigma$ is the trajectory of the system, i.e. $\vec{r}_\Sigma = Trf$. In search of a measure for the effect of a force, it seems natural to consider the integral line taken along the trajectory of the system on which it is acting. From (1) we have:

$$W = \int_{t_i}^{t_{i+1}} \vec{F} \cdot d\vec{r}_\Sigma = \int_{t_i}^{t_{i+1}} \frac{d}{dt} \left(m_\Sigma \frac{d\vec{r}_\Sigma}{dt} \right) d\vec{r}_\Sigma = \left[\frac{1}{2} m_\Sigma \frac{d^2 r_\Sigma}{dt^2} \right]_{t_i}^{t_{i+1}} \quad (2)$$

This integral line is scalar and is known as the work performed by force. It is denoted as W . This work is stored in the system as the kinetic energy of motion. The quantity $\left[\frac{1}{2} m_\Sigma \frac{d^2 r_\Sigma}{dt^2} \right]$ of the second member of (2) is defined as the kinetic energy of the system.

As we have seen in previous paragraphs, the responses converted into forces depend on the relationships and their intensity. We can divide the system into two subsystems, one emitting allowed responses and the other the not allowed responses (adverse effects). Abstractly, we can consider these two subsystems as two material points. Thus:

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$$W = \int_{t_i}^{t_{i+1}} \sum_{j=1}^2 \vec{F} d\vec{r}_{\Sigma} = \sum_{j=1}^2 \int_{t_i}^{t_{i+1}} \vec{F} d\vec{r}_{\Sigma} \quad (3)$$

That is, $W = W_I + W_A$ where W_I , W_A is the work produced by the ideals and adverse forces respectively. Thus, the ideal and adverse kinetic energies will be respectively:

$$\begin{cases} E_I = \left[\frac{1}{2} m_{\Sigma I} \frac{d^2 r_{\Sigma I}}{dt^2} \right] \\ E_A = \left[\frac{1}{2} m_{\Sigma A} \frac{d^2 r_{\Sigma A}}{dt^2} \right] \end{cases} \quad (4)$$

where $m_{\Sigma I}$, $m_{\Sigma A}$, $\vec{r}_{\Sigma I}$, $\vec{r}_{\Sigma A}$ respectively are the ideal and adverse virtual masses and trajectories.

As a simplification, we can consider that the system moves in a two-dimensional Cartesian space (Figure 5).

If the system has N sub-systems, the number of variables that define the system, in our case, is 2N. In the present case of two subsystems, we must have four. This space will be called the systemic configuration space. Usually, the motion of the system is limited by constraints. In general, it is necessary for the forces to maintain the system's constraints. The constraints restricting motion to a subspace suitably have fewer dimensions. In this case, of idealization, the forces constraining the motion of a particle in a geometric plane will be discontinuous.

Let us imagine instantaneous changes in the subsystems (particles) that comprise the system. These alterations are known as virtual displacement. We will denote by $\delta \vec{r}_{\Sigma}$ an infinitesimal virtual displacement of the subsystem. If the system is in equilibrium, then by definition $F = 0$ and it follows that:

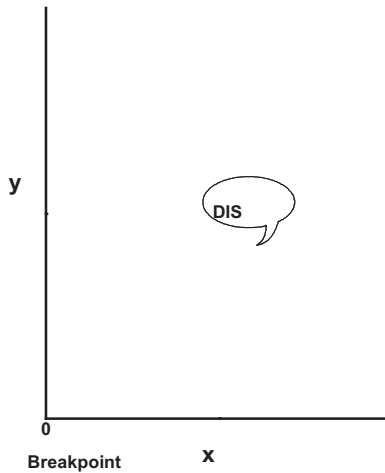


Figure 5.
Systemic space of
configuration

$$\vec{F} \delta \vec{r}_\Sigma = 0 \quad (5)$$

and also:

$$\sum_{j=1}^2 \vec{F} \delta \vec{r}_\Sigma = 0 \quad (6)$$

If the forces $\vec{F}$ are continuous functions of the position, (6) takes on a new meaning, which can be expressed as:

$$dW = 0 \quad (7)$$

then the work done during an infinitesimal virtual displacement of the system from an equilibrium position is zero. If there are constraints on the system, the forces may be classified as applied forces $\vec{F}^{(a)}$ or forces of constriction $\vec{F}^{(c)}$, therefore:

$$\vec{F} = \vec{F}^{(a)} + \vec{F}^{(c)} \quad (8)$$

Thus, [equation \(6\)](#) becomes:

$$\sum_{j=1}^2 \vec{F}^{(a)} \delta \vec{r}_\Sigma + \sum_{j=1}^2 \vec{F}^{(c)} \delta \vec{r}_\Sigma = 0 \quad (9)$$

It is not possible to interpret (9) as a proposition on the virtual work, as the discontinuous nature of the forces of constraint is inherent in the concept of constriction. The difficulty is overcome by the introduction of a new postulate:

$$\vec{F}^{(c)} \delta \vec{r}_\Sigma \geq 0 \quad (10)$$

for all $\delta \vec{r}_\Sigma$ compatible with the constraints. This is a proposition relating to the virtual addresses of the possible displacements, relative to the forces of constriction. For the system (considered as a particle) in the resting state on the plane defined in [Figure 5](#), the only displacements compatible with the constriction can be performed on the plane itself. Coordinating (9) and (10) gives:

$$\sum_{j=1}^2 \vec{F}^{(a)} \delta \vec{r}_\Sigma \leq 0 \quad (11)$$

The only forces involved are the applied forces, which can be assumed to be continuous in the systemic configuration space. Therefore, it is possible to interpret the result as a proposition concerning the work done by these applied forces during displacement compatible with the constraints:

Utopian and
dystopian
ideological
systems

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$$\delta W = \sum_{j=1}^2 \vec{F}^{(a)} \delta \vec{r}_{\Sigma} \leq 0 \quad (12)$$

The above equations refer to a DIS in static equilibrium (only in this case, only at the breakpoint 0). However, one DIS is moving (Figure 6).

Will establish the equations of motion:

$$\vec{F} = \frac{d}{dt} \left(m_{\Sigma} \frac{d\vec{r}_{\Sigma}}{dt} \right) \quad (13)$$

That is to say:

$$\vec{F} - \frac{d}{dt} \left(m_{\Sigma} \frac{d\vec{r}_{\Sigma}}{dt} \right) = 0 \quad (14)$$

For a virtual displacement, the following can be deduced:

$$\sum \left(\vec{F} - \frac{d}{dt} \left(m_{\Sigma} \frac{d\vec{r}_{\Sigma}}{dt} \right) \right) \delta \vec{r}_{\Sigma} = 0 \quad (15)$$

Forces are divided into applied and constraint forces:

$$\sum \vec{F}^{(c)} \delta \vec{r}_{\Sigma} + \sum \left(\vec{F}^{(a)} - \frac{d}{dt} \left(m_{\Sigma} \frac{d\vec{r}_{\Sigma}}{dt} \right) \right) \delta \vec{r}_{\Sigma} = 0 \quad (16)$$

Reducing the displacements to render them compatible with the constraints, we can postulate the following:

$$\vec{F}^{(c)} \delta \vec{r}_{\Sigma} \geq 0 \quad (17)$$

thus:

$$\sum \left(\vec{F}^{(a)} - \frac{d}{dt} \left(m_{\Sigma} \frac{d\vec{r}_{\Sigma}}{dt} \right) \right) \delta \vec{r}_{\Sigma} \leq 0 \quad (18)$$

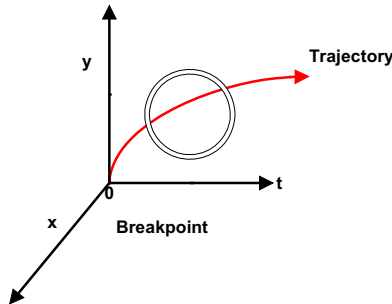


Figure 6.
DIS in motion

The first term of (18) can be identified as the work done during the virtual displacement. The second term is referred to as the inertial force of the DIS system.

$$\vec{I}_{\Sigma} = -\frac{d}{dt} \left(m_{\Sigma} \frac{d\vec{r}_{\Sigma}}{dt} \right) \quad (19)$$

Thus, (18) is:

$$\sum \left(\vec{F}^{(a)} + \vec{I}_{\Sigma} \right) \delta \vec{r}_{\Sigma} = 0 \quad (20)$$

The combined applied and inertial forces are known as effective systemic forces, i.e. according to our theory, allowed and forbidden responses by the system. If we consider the two subsystems, the subsystem that emits allowed responses and subsystem that emits forbidden responses, we have:

$$\begin{cases} \sum \left(\vec{F}_A^{(a)} + \vec{I}_{\Sigma A} \right) \delta \vec{r}_{\Sigma A} = 0 \\ \sum \left(\vec{F}_F^{(a)} + \vec{I}_{\Sigma F} \right) \delta \vec{r}_{\Sigma F} = 0 \end{cases} \quad (21)$$

These responses become stimuli for the system, converted into forces at time t (Figure 4). Let us suppose an application point of force (in this model, this would be a node). Assume that the actual displacement of the point of application is represented by a vector $\vec{d}$ at an angle θ with $\vec{F}$ (Figure 7).

Work W is given by:

$$W = FXOA = Fd \cos \theta = \vec{F} \cdot \vec{d} \quad (22)$$

Therefore, the performed work is the product of force by the displacement vector. Using this result, the work of two forces (allowed and forbidden) is equal to the work done by the resultant $\vec{R}$:

$$\vec{R} = \vec{F}_A^{(a)} + \vec{F}_F^{(a)} \quad (23)$$

Thus:

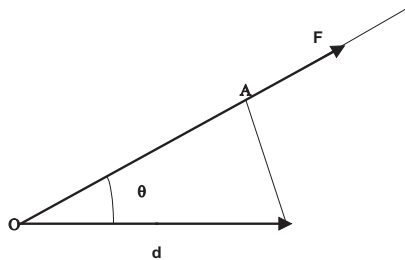


Figure 7.
Real displacement of
the point of
application of the
system

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$$W = \vec{F}_A^{(a)} \cdot \vec{d} + \vec{F}_F^{(a)} \cdot \vec{d} = (\vec{F}_A^{(a)} + \vec{F}_F^{(a)}) \cdot \vec{d} = \vec{R} \cdot \vec{d} \quad (24)$$

Consider the existence of two speeds: the speed of the allowable forces $\vec{v}_A$ driving the system according to the planned trajectory and the speed of the forbidden forces $\vec{v}_F$ pushing the system of ideal trajectory. We would be in the case of combined motion (Figure 8).

The overall speed of the system is:

$$\vec{v}_R = v_A \vec{j} + v_F \vec{i} \quad (25)$$

This means that, in a time interval, DIS traverses a virtual distance along the Y -axis due solely to the impulse of allowed forces acting as a motor and simultaneously another virtual distance along the X -axis exclusively because of the speed of forbidden forces acting as a stream without any movement, which can affect the other when both speeds are applied on different axes of the systemic configuration space. This means that the system arrives at the same time at a virtual horizontal parallel to the axis X , situated at the same distance as the target (utopia) but separated from it by a deviation. The only effect of forbidden forces is to produce a more or less pronounced horizontal movement. The parametric equations are:

$$\begin{cases} x = \vec{v}_F t \\ y = \vec{v}_A t \end{cases} \quad (26)$$

The time to reach the virtual horizontal t_r is determined by the second equation, as the motion along the X -axis does not affect the motion along the Y -axis:

$$t_r = \frac{s}{\vec{v}_A} \quad (27)$$

The deviation is determined from the second equation and time of travel:

$$d = x t_r = \vec{v}_F t_r \quad (28)$$

The deflection angle is calculated by the tangent:

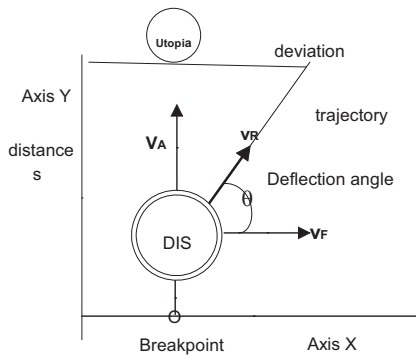


Figure 8.
The combined motion
of DIS

$$tg\theta = \frac{\vec{v}_F}{\vec{v}_A} \quad (29)$$

where:

$$\vec{v}_F = \vec{v}_A tg\theta \quad (30)$$

To achieve the final goal (utopia), the system must be directed against the forbidden forces to compensate for speed. The angle of deviation must be such that when v_A is decomposed, the component on the X -axis compensates for the speed of prohibited forces $\vec{F}_F$. These speeds are annulled, eliminating movement along the X -axis. The other component of the velocity of the system produces progress along the Y -axis (Figure 9).

Decomposition of the system's speed produces the following speeds:

$$\begin{cases} \vec{v}_{AX} = \vec{v}_A \sin\alpha \\ \vec{v}_{AY} = \vec{v}_A \cos\alpha \end{cases} \quad (31)$$

No deflection condition implies that the velocity along the X -axis must be zero so that the deflection angle is:

$$\vec{v}_{AX} = \vec{v}_F \quad (32)$$

$$\vec{v}_A \sin\alpha = \vec{v}_F \quad (33)$$

$$\sin\alpha = \frac{\vec{v}_F}{\vec{v}_A} \quad (34)$$

For (31):

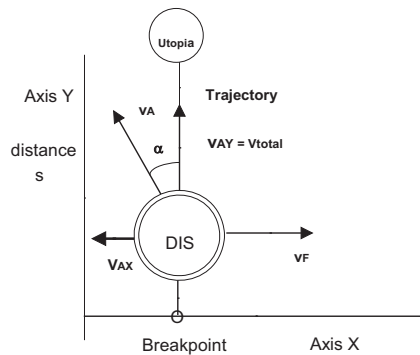


Figure 9.
Correction of
trajectory

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$$\begin{aligned}\vec{v}_{total} &= \vec{v}_{AY} = \vec{v}_A \cos \alpha = \vec{v}_A \sqrt{1 - \sin^2 \alpha} = \vec{v}_A \sqrt{1 - \frac{\vec{v}_F^2}{\vec{v}_A^2}} = \vec{v}_A \sqrt{\frac{\vec{v}_A^2 - \vec{v}_F^2}{\vec{v}_A^2}} \\ &= \sqrt{\vec{v}_A^2 - \vec{v}_F^2}\end{aligned}\tag{35}$$

As:

$$\begin{cases} \vec{v}_A = \frac{\vec{F}_A t}{m} \\ \vec{v}_F = \frac{\vec{F}_F t}{m} \end{cases}\tag{36}$$

To (35)

$$\vec{v}_{total} = \sqrt{\frac{\vec{F}_A^2}{m^2} - \frac{\vec{F}_F^2}{m^2}} = \frac{t}{m} \sqrt{\vec{F}_A^2 - \vec{F}_F^2}\tag{37}$$

Thus:

$$\frac{\vec{v}_{total} m}{t} = \sqrt{\vec{F}_A^2 - \vec{F}_F^2}\tag{38}$$

and:

$$\vec{F}_{total} = \sqrt{\vec{F}_A^2 - \vec{F}_F^2}\tag{39}$$

thus $\vec{F}_{total}^2 = \vec{F}_A^2 - \vec{F}_F^2$ (40):

We can extract the following consequences:

- *Case 1:* If $\vec{F}_A = \vec{F}_F \Rightarrow \vec{F}_{total} = 0$ the system is in equilibrium, at least for a while.
- *Case 2:* If $\vec{F}_F < \vec{F}_A$ the system can achieve its goal.
- *Case 3:* If $\vec{F}_F > \vec{F}_A$ the result of the square root is imaginary. It can be interpreted as the destruction of the system.

It is an ideal situation, which is being discussed here. This does not take into account the fact that both permitted and prohibited forces depend on the flexibility or rigidity of the internal relationships (or sheaves) of the system (*H1* and *H2*). The trajectory corrections are only possible by increasing the difference between the forces $\vec{F}_A$ and $\vec{F}_F$. This would be possible by decreasing the rigidity of certain relationships (or sheaves) of the system. However, we are not talking about a physical but a social system. Because of the idiosyncrasies of the utopian ideological system, the rigidity of certain relationships (or sheaves) is increased. For *H2*, adverse effects will occur with increasing intensity. As a result, the deflection will either be increased or the system is in case 1, creating an unstable

equilibrium. Even in the case of equilibrium, maintaining this state will produce increasingly intense forbidden forces to move toward case 3, entailing the destruction of the system [11].

7. Conclusions

Society is separate and distinct from the polity. It is as foolhardy to expect a Paradise on Earth through political action as much as through economic action; such thinking ignores that an economy or a polity is nothing more than an institution constructed to serve society. Glossing over this recognition damages societal vibrancy and atrophies the polity; it can hardly manage its basic duties competently, let alone the numerous tasks it is now assigned. Infusion of state power corrupts any societal institution, be it church, economy or society. The problem of politics is not *Who should rule?* but *How can we correct the mistakes of policy without violence?*; not *How can we make people good or happy?* but *How can we minimize avoidable suffering?*; not *What is the best state?* but *What can we do now to make things better?* (Popper, 1971). The virtues of democracy are that, of all known systems, it is the one where policy *can* be reformed most peacefully and most rationally and the one, which is least likely to inflict or condone needless or unequal suffering. As for the virtues of piecemeal social engineering and reform over the construction of Utopias and revolutions, one would think they had spoken for themselves after the 20th century; but no. Reliance on a monolithic polity to care for its citizens is not only inefficient but also dangerous. By overreaching its proper realm, the legislation makes a mockery of law and harms its respectability. Cicero said *more laws, less justice*; when legislation intrudes into the mundane lives of individuals and carries greater responsibility, a slackening of personal responsibility, incentive and initiative inevitably arises. Previous actions and responsibilities held by individuals and communities shift to burden the polity. The increased power and scope leads not only to market intervention but also hampers social liberty (as unintended effects).

While striving for utopia through the use of state power may be (in principle) laudable, honest ideas cannot redeem harmful consequences. F.A. Hayek wrote in *The Fatal Conceit* (p. 76), *the curious task of economics is to demonstrate to men how little they really know about what they imagine they can design*. A rigorous theory does not perfectly translate into an improvement in reality. It is impossible to aggregate scattered and incomplete knowledge into the hands of a few people because the actions of many people in society may limit what can legitimately be accomplished through human design. The recognition of limitations on social structures and achievements allow society to avoid pitfalls that lead to a regression while holding a reverent, but critical, opinion on tradition. Instead of placing the fault on a minority seen as greedy or saboteurs, societal structures can be re-examined and attempts to fix a social problem can be more effective. Such a view also preserves the dignity and liberty of the individual to prosper and improve society while lessening the damage caused by harmful action. Spontaneous experimentation by individuals and organizations yields better results than a bureaucratic, centralized approach by a politically-controlled state. Naturally, experimentation will not lead to the perfect society, but it will yield results that improve on tradition and societal cohesion.

We agree with Rothstein *et al.* (2002) that every utopia is really a dystopia – a disaster in the making – one that overlooks the nature of humanity and the impossibilities of paradise. He traces the ideal in politics and technology and suggests that only in art – and especially in music – does the desire for utopia find satisfaction. Small changes produce little unintended effects and that is the only way to achieve gradually a more just world but never a utopian one.

1. *Impure sets* (Maddy, 1990) are sets whose referential elements (absolute beings) are not counted as abstract objects and have the following conditions: They are real (material or energetic absolute beings). They exist independently of the subject. S develops p -significances on them. True things can be said about them. Subject can know these true things about them. They have properties that support a robust notion of mathematical truth. A *DIS* is an organization of knowledge on the part of the subject S that fulfils the following ones: Other subjects (human beings) are elements of the system. Some existing relations between elements have deontic modalities. There is purpose (purposes).
2. Here we use the word signifier, following Sturrock (1986, 31, 32) and quoting from the text of Saussure's course in general Linguistics (1983, translation by Roy Harris): "Although, following the practice of John Sturrock in using this translation I have retained the terms "signifier" and "signified" rather than use Harris's translation of signifiant as "signal" and signifié as "signification." In any process, we can distinguish that it has a *signifier* as an inherent property and having *significance* when it is related to the rest of the processes of the perceived reality that the subject considers as a The existence of information is independent of the fact that there is a subject able to decode the message, to which the subject is attempting to communicate. This objective information is termed signifier. The information in a message acquires meaning if a subject decodes the message. This subjective information is termed significance. Therefore, the signifier is an ontic property, considering that the significance will be a system of meaning. The signifier is absolute and infinite; the significance is relative and finite. The signifier comes from absolute being and significance generates the relative being. The signifier is interpreted as the material or physical form of the sign and is something that can be caught (perception) by some of the traditional senses of the human being. The significance, on the other hand is a *mental construct*. In our approach, the signifier has a truth value equal to 1, that is to say, $v(S) = 1$, whereas the significance has as truth value a real positive number $v(S)$, between 0 and 1, with 0 corresponding to *absolute ignorance of the signifier* (therefore of the process) and 1 to *absolute understanding*, that is to say, $v(S) = v(s)$.
3. In the original work of Esteve-Calvo and Lloret-Climent (2006), trajectories are called orbits. The authors have chosen the latter name as more appropriate for our purposes.
4. Let $S = (M, R)$ be an impure system linkage and let $A \in P(M)$ with the structural input-output function f_M . We say that A is invariant if $f_M(A) \subseteq A$.
5. Let $S = (M, R)$ be an impure system linkage and let $A, B \in P(M)$ with the structural input-output function f_M . We say that A covers B if $f_M(A) = B$. In other words, each element in A should directly influence an element in B. From the definition it can be deduced that $B = \bigcup f_M(x), \forall x \in A$. The coverage property is not reflexive, symmetrical or transitive. It would be transitive, however, if we referred to *exercising indirect influence* rather than *directly influencing*. This fact does not detract from it in any way; on the contrary, although less evident mathematically it is fully justified given the large number of practical cases that comply.
6. The Lexicon J is set formed by p -significances (relative beings) of absolutes beings or their attributes or either by notions, terms (variables and constants, predicates and verbal forms and logical constants).
7. From the Greek $\alpha\lambda\upsilon\sigma\iota\delta\alpha$: *chain*
8. By comfort, we will denote the impure systems as Σ . We choose this letter because of being the first of the word "system" in Greek: $\sigma\acute{\upsilon}\sigma\tau\eta\mu\alpha$.
9. In "a real" sense, the structure of a DIS will be formed by all the legislative bodies (*legal structures*) in any type of human society, from the most primitive to the most developed. We will establish an analogy with the human being: the existence of relations with positive imperative modality (*obligation*) would constitute the skeleton of the system. The negative imperative modality (*prohibition*) would be the immunological system of protection of the system. The modality

permission the muscular system, that gives the necessary flexibility to the system, in as much to the modalitychoice its neurocerebral system because allows decision-making. Transactions of energy, money, merchandize, population, etc., would be equivalent to blood circulatory. These economic transactions and inferential relations, depend, as well, of the existence of a legislative body (*Mercantile Code*), with their obligations, prohibitions and permissions that regulate them. Transactions of raw materials, energy, merchandize, currency, etc, along with inferential relations of ideas, culture, etc can be either stimuli or responses in the system.

10. In a first approach, the mass is considered constant. In reality it is not, but for clarity, we have adopted this criterion.
11. For Nescolarde-Selva, J. and Usó-Doménech, J.L. 2013^c the breaking energy of a relation is the energy needed to destroy the relation between two $\phi_1^0, \phi_2^0 \in \mathfrak{I}$ elements of the deontical system. The energy of relations E_Σ is defined as the mean energy needed to maintain particular relations in a deontical system and not separate the elements that constitute the system from each other.

$$\text{Therefore } E_\Sigma = \frac{\sum_{i=1}^n E_n}{m}.$$

Let r be the number of sheaves needed to break the conncection energy E_r and less than the connection energy E_Σ of impure system DIS, that is to say $E_r < E_\Sigma$. Elements of the impure system fulfilling this condition are called *weak connections*. In the opposite case, they will be *strong connections* as the stronger one is whichever is greater in its breaking energy in comparison to the energy of connection of the impure system. We considered all incident stimuli in an impure system DIS as a relation located within a d-sheaf, coming from an alysidal set located in the stimulus environment H' (Lloret-Climent *et al.*, 1998, 2001, 2002; Patten, 1978, 1980, 1982; Patten *et al.*, 1976, 1982; Patten and Auble, 1981; Nescolarde-Selva *et al.*, 2012a, 2012b; Nescolarde-Selva and Usó-Doménech, 2012; Usó-Doménech and Nescolarde-Selva, 2012, 2013) and so that $A_{al} \subset H'$ and affecting a certain node of a certain chain of the impure system DIS. Of course, this relation that unites a node n_i of a chain $\phi_i^k \in A_{al}$ of the alysidal set A_{al} with a node m_j of a chain $\phi_j^m \in DIS$ will have a certain connection energy. However, for DIS, this conncection energy becomes a stimulus energy E_Z . Let us suppose entering in the impure system DIS in the stimulus environment H' , with a set of stimuli Z , with an energy E_Z and so that $E_Z > E_r$ and $E_Z \leq E_\Sigma$. If the energy of the group of stimuli Z entering the impure system coming from the stimulus environment H' is greater than the energy of rupture of the elements of weak connection, the system will experience a loss of order, and therefore of structuring and information. Then, in the opposite case, if the group of stimuli Z has an inferior energy to the energy of rupture of the elements of weak connection, impure system will experience a net gain of order, and therefore of structure and information.

Sagan's (1975) Principle: If the energy of the group of stimuli Z entering the system from the exterior stimulus medium H' is greater than the relation energy of the elements of the system with a weak bond, system Σ will experience a loss of order, and therefore of structure and information. Then, in inverse terms, if the group of stimuli Z has an energy lower than the rupture energy of the elements of the system with a weak bond, system DIS will experience a net gain of order, and therefore of structure and information.

The threshold of resistance u_Σ of a system is marked by its bond energy E_Σ .

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