

PUBLIC SELECTION BASED ON QUALIFICATIONS AND INTERVIEW FOR THE AWARDING OF NO. 7 GRANTS LASTING 24 MONTHS FOR CONDUCTING RESEARCH IN ACCORDANCE WITH ART. 22 OF LAW OF 30.12.2010 NO. 240 AT THE DEPARTMENTS OF THE UNIVERSITY OF BERGAMO WITHIN THE RESEARCH PROGRAMME CALLED "STARS SUPPORTING TALENTED RESEARCHER" – ACTION 1 FOR THE YEAR 2018 – II TRANCHE (CUP: F52F16001350001)

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RESEARCH PROJECTS

Annex code 1

"Discontinuous changes, chaos, attractors: a new epistemological perspective for natural and human sciences."

Department of Human and social sciences

Scientific Director: Prof. Gianluca Bocchi

A.R.F.: 11/C2 - Logic, history and philosophy of science - A.D. M-FIL/02 - Logic and philosophy of science

The subject of discontinuous change is nowadays very relevant in a lot of scientific fields, such as: biology, natural sciences, mathematics, physics, engineering, psychology, sociology and human history as well. Chaos theory, with all its subsequent developments, is a line of research contributing extremely to the investigation of this subject, since it was originated to approach non-linear dynamical systems, that are characterized by an intrinsic and irreducible unpredictability. These systems are extremely sensitive to initial conditions, and a very small fluctuation in these conditions may grow exponentially within a not too long period of time. It's just such a feature that imposes basic structural limitations to human predictions.. Furthermore, we must remind that a system is defined as a complex structure made by many mutually interacting elements: the interactions between the elements of the systems and between these elements and their environment govern the system itself, by determining its evolution and its development within the context of an epigenetic landscape and through the emergence of particular chreodes (using Conrad Waddington's enlightening conceptualization). Also, we must remind that it's quite impossible to study the behaviour of a particular system by observing or separating a single part of theirs, which counts both for natural world and for human one: it's wholly impossible to make models of human consciousness through focusing on single neurons or on single neuronal networks.

Since the sixties of last century, chaos theory has inspired scientists of all sorts, and guided them in constructing a great deal of models aiming at studying discontinuous changes and threshold effects in a very broad range of fields such as: biochemistry, biology, economy, mathematics, medical sciences, motility, philosophy, physics, psychology... Above all, researches centered upon typical dynamics of states of crisis ('bifurcation points') and upon effects of random events in discontinuous changes, adopting a general epistemological landscape that we may define as 'complexity thinking'. The utilization of metaphors and conceptual tools generated within such an epistemological tendency is a key perspective for developing models aiming at better observations and explications of objects studied by human and social sciences. Here we have to refer to a broad utilizations of a conceptual tool such as attractors, a conceptual tool that helps to understand how and why far-from-equilibrium states may generate new equilibrium states that are metastable, subject to further evolution.

The aim of this research project is the investigation of models, conceptual tools, metaphors that have been and are being developed concerning discontinuous changes in the fields of natural sciences (such as chaos theory), linked with an analysis of their strong consequences in the fields of human studies. A good deal of work may be devoted also to the investigation of relevant case studies. The adopted framework supports the emergence of a new vision of human beings, as complex systems made of complex systems, on the edge between their biological roots and the development of novel higher-level systems (such as social and cultural ones). This vision has a strong effect, for instance, on the ways in which therapeutic practices in various fields have to be sketched out and directed.

The various phases of the development of the project (24 months overall) may be detailed as follows:

-First year, first semester. Gathering of theoretical approaches with bibliographic researches: a specific attention must be devoted to theoretical approaches concerning the relevance of models of discontinuous changes (system theory, chaos theory, evolutionary tradition) for human sciences.

-First year, second semester. Analysis of theoretical models and related researches through which specific social, political and cultural dynamics have been studied, while being aware of the ways in which these models and these researches have inspired a new vision about the local consequences of current global processes.

-Second year, first semester. In-depth analysis of relevant case studies, within the fields of human sciences, emphasizing the issue of sudden and discontinuous change and analyzing it through models originated within the framework of sciences and epistemology of complex systems.

-Second year, second semester. Elaboration and systematization of collected items, aiming at publishing a few paper and at presenting the results of the researches in national and international conferences and seminars.

"Giuseppe Tamagnini and the typography at school: a project of educational renewal between avant-garde and tradition in Italy during the second postwar"

Department of Human and social sciences

Scientific Director: Prof. Evelina Scaglia

A.R.F.: 11/D1 - Educational theories and history of educational theories - A.D. M-PED/02 - History of pedagogy and education

The biennial research project aims at analysing the figure of Giuseppe Tamagnini and his contribution to Italian Education in the second half of the XX century. Primary teacher and not academic pedagogue, since the Fifties Tamagnini had experimented a "popular" form of active didactics, spreading in Italy the thought of Célestin Freinet through his participation to the Mouvement Freinet and the Fédération Internationale Mouvement de l'Ecole Moderne (F.I.M.E.M.).

In particular, the project is aimed at:

1. reconstructing, from an historical point of view, time and manners of the reception of Freinet's thought in Italy during the second postwar, with a comparison with other European and not European countries in that period;
2. showing how the subscription of "Freinet's techniques" by some Italian teachers, which had conducted their initial teacher training according to the idealistic school during Fascist regime, tried to answer to an ideal tension towards a democratic and shared social system, even if it conveyed a quite anachronistic organizational model, due to a close connection with the past rural conditions of Italy;
3. identifying the existence of an ideological link between the Movimento di Cooperazione Educativa, the Italian Communist Party and Fondazione Gramsci, whose Tamagnini was an active member for some years;
4. demonstrating if, in spite of an explicit opposition, the "Freinet's techniques" based on the use of the imprimerie à l'école had been recognized also by Catholic scholars;
5. finding out in some Movimento di Cooperazione Educativa' techniques a sort of "anticipation" of the latest "competence-based didactic approach".

“Semantic cohesion and couple assessment”

Department of Human and social sciences

Scientific Director: Prof. Valeria Ugazio

A.R.F.: 11/E4 – Clinical and dynamic psychology - A.D. M-PSI/08 - Clinical psychology

The couple's life together starts by the meeting of two worlds of different meanings, the result of each partner's previous co-positionings (Harré & Moghaddam, 2003) within their family of origins and their previous significant relationships. Each partner during the course of their personal story has developed particular ways of building relationships emotionally and cognitively. Although we are able to understand the meanings widespread in our culture, we are unable to properly interact within meanings alien to our relational contexts.

According to the theory of semantic polarities (Ugazio, 1998, 2013), a couple has a short life if the respective semantic world do not find a co-positioning. The construction of a couple relationship requires a negotiation of partners' respective meanings, generally associated with emotional destabilizing moments, called enigmatic episode (Ugazio, 1998, 2013), which can lead to the relationship ending or to the creation of new semantic games.

The semantic cohesion is about togetherness, as Olson's (2000) cohesion, but it inserts a new dimension about which the couple should find a co-positioning: the semantics. The semantic cohesion is defined as the degree to which partners share their meanings during the conversation, i.e. the proportion of semantic polarities belonging to the same semantic shared by each couple compared to the total number of semantic polarities created during the conversation by each couple. There are two kinds of semantic cohesion: one is about verbal meanings exchanged during the conversation (narrated semantic cohesion), whereas the other is about partners' mutual positionings, expressed mainly by nonverbal communication (interactive semantic cohesion).

The main aim of the study is to analyze the degree to which partners share their meanings during the therapeutic conversation. The goals are to explore the narrated and interactive semantic cohesion and to verify if these two kinds of semantic cohesions are similar or different within each couple.

In order to measure the semantic cohesion, we will use two instruments: the Family Semantic Grid II (FSG II; Ugazio & Guarnieri, 2017), aimed to identify the narrated semantic polarities and the FSG III (Ugazio, Guarnieri & Sotgiu, 2018) aimed to pinpoint the interactive semantic polarities. Both of the instruments were already applied to two single case studies (Ugazio & Fellin, 2016; Ugazio & Guarnieri, 2018).

These instruments will be applied to video-recorded and transcribed first two sessions of consultations of 30 heterosexual couples, leaving together from at least two years, who asked for a couple therapy. Half of the couples are from Western cultural background (mono-cultural couples). The other half are intercultural couples, where one member is Western whereas the other is a migrant of first generation. The FSG II will be applied to the transcription of the first two couple sessions of each couple (60 sessions) and the FSG III to the video-recording of the same sessions.

The various phases of the development of the project (24 months overall) may be detailed as follows:

A. Recruiting the couples and conducting clinical sessions with them (6 months). We will collaborate with the London Intercultural Couples Centre and with some colleagues of East London University to recruit the intercultural couples. We are already in contact with these institutions.

B. Integral transcriptions of the first two sessions of each couple consultation and qualitative analysis (4 months).

C. Identifying and coding the narrated semantic polarities through FSG II within the session transcriptions and quantitative and qualitative analyses (6 months).

D. Identifying and coding the interactive semantic polarities through FSG III within the session video-recordings and quantitative and qualitative analyses (6 months).

E. Analysis of the data and preparation of the publications (2 months).

It is expected that the semantic cohesion has a curvilinear Gaussian pattern with the more functional scores at the centre. It is hypothesized that the semantics of the analysed couples are part of the semantic of “freedom”, “goodness”, “power” and “belonging”, at the centre of the family semantic polarities model (Ugazio, 1998, 2013). Furthermore we expect that 5 types of semantic cohesion emerge:

Semantic Assimilation. A partner's semantic becomes the dominant world for the couple.

Previous Semantic Sharing. The couple shares the same dominant semantic, presumably since before they have met.

Semantic Bidirectional Exchange. Each partner keeps his own prevailing semantic but is able to enter into the other's semantic.

Semantic Sharing. The couple creates a “semantic togetherness” in which it is not possible to track down couples conversations in which the dominant semantic of one partner emerges. When the couple is together a new semantic world emerged, different from the two original semantics.

Semantic Separation. The couple doesn't create a shared semantic plot. Each partner uses his/her own prevailing semantic, developed in previous belongings, unable to enter in the partner's meanings.

We hypothesize that the “previous semantic sharing” and the “semantic sharing” are more frequent in monocultural couples than in intercultural couples. Furthermore, we expect that the semantics of “belonging” and “freedom” are more common among intercultural couples.

"The interim protection and the comparison of interests"

Department of Law

Scientific Director: Prof. Gabriella Crepaldi

A.R.F.: 12/D1 - Administrative law - A.D. IUS/10 - Administrative law

During the first semester, the researcher will be focused on reconstructing the essential characteristics of the interim protection in the Italian administrative trial. Since the law n. 5992 of 1889 the submission of the jurisdictional appeal doesn't have suspensive effect of the administrative measures challenged, admitting however that the execution of the same can be suspended for serious reasons by the administrative judge.

The forecast has been confirmed by all the followed laws, including the current administrative trial code, and the interim protection, which aims to avoid that, as stated by CHIOVENDA, the trial can go to the detriment of part that is right in the trial, represents one of the most vital and fundamental forms of protection provided by the administrative judge.

Traditionally, the provision is conditional upon to two fundamental requirements: the *fumus boni iuris* and the *periculum in mora*. The analysis of the interim measures shows, however, that the administrative judge, when granting these measures, shall verify a further requirement, that it also constitutes an interim protection's element: and in fact, he verify the interests concerned, public and private, effecting a comparison. For this reason, continuing the job, in the second semester, the researcher will examine the case law to verify how the administrative judge carries out the comparison of the interests concerned so that it becomes the third requirement, not prescribed by law but necessarily take into account for the interim measures' provision.

Developing the job, ideally in the third semester, the researcher will examine the civil trial's discipline to verify, through an analysis of doctrine and case law, if civil judge in determined cases when the precautionary needs are more evident, as in the case of interim measures' provision according to the interim uniform rite ex artt. 669 ss. civil trial code, of the emergency measures ex art. 700 civil trial code or of actions of unfair competition's inhibition ex artt. 2598 ss. civil code, carries out a comparison of the interests concerned in the same way of the administrative judge or if he carries out his assessment upon the traditional requirements of the *fumus boni iuris* and *periculum in mora* without further declinations.

Finally, in the last period, the researcher will compare the Italian administrative trial with the French one, in a particular way with the *référé*' legal framework. Assuming that the French legislation doesn't provide a systematic legal framework of the administrative trial's interim protection, the researcher would investigate, through a careful analysis of Conseil d'État case law and French doctrine, the necessary requirements to provision of the interim measures, and therefore if the French administrative judge, beyond the urgency condition, concretely appraises the interests concerned, especially when the *référé* has to protect a citizen fundamental freedom towards the Administration illegal action, as with the *référé-liberté* (art. L. 521-2 administrative trial code). It comes to assessing possible analogies or differences among the two national legislations.

"The challenge of abstract concepts: The role of causation"

Department of Letters, Philosophy, Communication

Scientific Director: Prof. Alfredo Paternoster

A.R.F.: 11/C4 – Aesthetics and philosophy of languages - A.D. M-FIL/05 – Philosophy and theory of language

The project aims at investigating in an interdisciplinary perspective the hypothesis, largely unexplored up to now, that the cognitive difference between abstract and concrete terms is mainly based on the collection of our pre-theoretical intuitions concerning physico-mechanical causation. On this view, a concrete term denotes an entity that we intuitively perceive as "causally efficacious", i.e., as something that can entertain causal/mechanical relations with other concrete items, whereas an abstract term denotes an entity we perceive as "causally inert". As a consequence, information about the "causal power" of a given object will likely constitute one of the main criteria to distinguishing the mental representations of the meaning of abstract entities from those of the meaning of concrete entities.

In the light of a deep critical analysis of the relevant philosophical and psychological literature, the hypotheses will have to be evaluated whether:

- a) cognitive representations of the meaning of concrete vs. abstract terms are different following in the first instance the existence of a specific mechanical schema associated to lexical entries;
- b) the mechanical schema can be reduced neither to a collection of specific sensorial information (learned by experience), e.g., visual or tactile, nor to manipulation and motor interaction schemas

The implication of the latter hypothesis for the traditional views of language and concepts will have to be discussed, as well as for the cognitive representation of abstract and concrete terms.

"Experimental study of productive processes from biological resources - BIOFAT"

Department of Engineering and applied sciences

Scientific Director: Prof. Isabella Natali Sora

A.R.F.: 03/B2 – Principles of chemistry for applied technologies - A.D. CHIM/07 – Principles of chemistry for applied technologies

The project aims to develop innovative technological solutions to produce hydrocarbons from renewable resources, such as vegetable fats. It is planned to develop an electrolytic cell for the synthesis of Kolbe, which uses materials suitable to reduce the process of anodic passivation and the accumulation of semi-solid hydrocarbons between the electrodes. Specifically, the aims of the project include the preparation and selection of innovative electrodes, aimed at facilitating an industrial type use of an electrochemical process of fatty acid transformation. The second objective of the project is the development of an innovative photochemical process for the production of dihydroxyacetone, starting from a byproduct of the oil and fats industry.

"Repair and Strengthening of concrete structural elements by using sulfo-alluminate based concrete"

Department of Engineering and applied sciences

Scientific Director: Prof. Paolo Riva

A.R.F.: 08/B3 – Structural engineering - A.D. ICAR/09 – Structural engineering

The research project is focused on the experimental testing of structural elements subjected to static, seismic, or cyclic actions. To this end, experimental tests on full scale or small scale structural elements will be carried out. The tests will be mostly directed to the development of technologies based on the use of sulfo-alluminate concretes for the retrofit of structural elements in existing constructions.

The candidate duties will consist in organizing, managing and programming the experimental activity of the Laboratory, starting from the design of the test-setup and of the test itself, ending with the preparation of the final test report.