



**Research Committee 51  
on Sociocybernetics**

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ISA International Sociological Association

***Newsletter 20***

December 2006

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## 1. PREFACE FROM THE EDITOR

### Times are changing

These are great times that are indeed, changing.

To begin with, RC51, as an active scientific group in a globalizing society, had a very interesting and successful conference in South Africa.

On the one hand we could observe how in a rapidly evolving society such as South Africa, the 'Quality of the Social Existence' due to Globalization (the topic of the conference) was quickly changing. "It's eroding to a criminal disaster," according to a spokesman we met on our way from our hotel to the well-guarded conference venue. His assertion seemed to be confirmed by the fact that some conference participants were harassed and some, even raped. Despite the warnings that you should never walk alone, I did enjoy some interesting city strolls at night in Capetown and the cozy afternoon tea events in the Durban Botanic Garden. My naive attitude to the dangers of our globalized world was confirmed by another more optimistic spokesman who contemplated the advantage of Western capitalists leaving Africa while the more socialistic Chinese capitalists were coming in. An interesting topic to ponder for a social scientist such as myself who tries to understand such a world in transition.

On the other hand, we had the freedom to discuss in a scientific way how we could support society to improve the 'Quality of the Social Existence in a Globalizing World.' It was of course a pity that black South Africans were not well represented in most of the sessions (For example, students from the local university were not invited to participate due to the the budget fee they could allow). But restricting ourselves to the legal conference participants, it has to be said that the discussion was lively. The RC51 sessions were also very successful in this respect. Presentations and discussions were passionate, well-attended and of high quality. Colleagues of other research committees who participated in RC51 joint sessions even congratulated me on the high quality of our sessions. So, I am happy to report that the aim of the RC51 board, especially of the Quality Group chaired by our now Former Vice-President Vessela.Misheva, to realize high quality sessions was realized in the Durban conference.

The goal that the quality of the papers of our members be high was also made public by our now Past President Bernd Hornung who granted the Buckley Award to Jose A. Amozurrutia. As a citizen of a globalizing world and a country in transition, Jose shows that advanced sociocybernetic theories and instruments are not restricted to well-developed Western countries. You might even ask yourself whether our so-called 'First World' is not in a period of decline, our social sciences not in a phase of stagnation, and that our sociocybernetic hope has to be sought in the enthusiasm of people from countries in transition such as Jose. In any case, you can judge the quality of his scientific contribution by yourself because we are happy to include his paper in this newsletter.

That times are changing for RC51 is also mirrored in the fact that we have a new board. It is reported in this newsletter by the illustrious trio Felix Geyer, Bernd Hornung and Chaime Marcuello. Our former board did a splendid job and we owe our Past President a lot of gratitude for his example. We are glad that, as a spokesman of the old board, he includes a letter to us in this newsletter about this changeover. The old board has left a well-developed foundation for our efforts to change the social sciences to a genuine sociocybernetic enterprise. It is a head start for our new board. Bernard Scott as the New President is happy to lead this new period and writes in his maiden letter as President about his hope that we "become viable 'ships' in an apocalyptic sea, wise in our governance and 'self-steering'."

Another forerunner in this turbulent time of changeovers is our former Webmaster and new Secretary Chaime Marcuello. As is announced in this newsletter he recently published about our sociocybernetic thoughts for the Spanish-speaking community in a wonderful book, *Sociocibernética*. Backed up by a long tradition of discussion in sociocybernetic topics and expert knowledge of the Luhmannian approach, Loet Leydesdorff has also published a new book, *The Knowledge-Based Economy: Modeled, Measured, Simulated*. It has drawn wide attention from sociologists and earned laudatory reviews. We are glad that this representative ("the top," according to Jose) of a still vital part of the Western social sciences and member of RC51 gives a short introduction of his book in our

newsletter. To continue the work of Luhmann and book progress in the methodological and empirical domain is also the aim of a series of conferences in which German, British, Danish and Dutch scholars participated. And our Board Member and new Webmaster Barry Gibson announces a conference in Croatia, ‘*Methodologies of systemic theory – empirical research and form analysis*’ to be held in April 2007.

In the meantime, our Spanish members continue their enthusiastic contribution to our sociocybernetic progress. It is reflected in the announcement of Juan Miguel Aguado of our next interim-conference, in Murcia, Spain, 18-23 June 2007. If you take yourself and the sociocybernetic project seriously, you can’t miss it. Be mindful of the deadlines of submissions. A declaration of intent (to participate) has to be mailed by *January 15*. You can begin practicing your Spanish at this conference and prepare yourself for the *next* conference organized by our Mexican colleagues in 2008!

Finally, we end this issue with a selection of Calls for Papers and Activities. Once again we invite you to submit your contributions of short articles, announcements, and interesting Calls for Papers and Activities. This will permit us to keep our newsletter alive, useful and relevant to you, our valued members. Enjoy a Happy Christmas and a Wonderful New Year!

*Cor van Dijkum*  
*Editor-in-Chief*

## 2. LETTER OF THE PAST PRESIDENT

Dear Members of RC51,

In my letters to you, which appeared in this place previously, I always tried to point out important achievements, current problems, and, above all, perspectives for the future.

Today, as I write to you once more as your Past President, I think that the most important achievement of RC51 is the fact that you have elected with a great unanimity a new board and a new President who, in my conviction, form an excellent and outstanding team. I am very glad that I can hand over my own responsibilities to Bernard Scott as an internationally renowned and esteemed systems scientist as well as an excellent organizer who, moreover, never forgets the human side of our busy lives.

I am sure the new team under Bernard's leadership will successfully carry on RC51 in the years to come. I wish to stress the word "team" here because, since our memorable Bucharest conference in 1996 when our now Honorary President Felix Geyer had to run everything by himself in getting sociocybernetics under way, we've made a lot of progress distributing work among more shoulders. This was quite a success, in particular during the last period with the Brisbane Board. We all, and myself in particular, always greatly appreciated Felix's continuing and very substantive contributions and his invaluable advice up to the present moment. However, the amount of work could not have been accomplished without the very active contributions of all of the Board Members and also of quite a number of other RC51 members who did not have a formal position.

I want to take this opportunity to most cordially thank all of you, and in particular Felix, for your contributions to the organizational and scientific work done in RC51, but also for your friendship and spirit of cooperation which made otherwise often hard work a real pleasure.

Without this spirit and cooperation it would not have been possible to run such successful RC51 conferences, our *International Conferences of Sociocybernetics*, nor to cooperate with and gain recognition by international institutions like the WOSC, ISSS, IFSR, UES/ESSU, AFSCET, and ISSC, quite apart from the high esteem we enjoy inside the ISA. When we set out in 1998 in Montreal to make sociocybernetics (socio-what???) a trademark to be well-known in the social science community both for substance and quality, this seemed to be an extremely ambitious, if not crazy, goal. Today, with the cooperation and support of all of you, I dare say we have come a long way, in between being reduced by an ISA decision to an RC with 4 (four!) members in good standing. I do not want to say that we have already fully reached our goal. A lot is still to be done and we must not get lazy.

However, the new board finds a well-developed foundation on which to build. A newsletter, two electronic journals, a magnificent website, a brilliant record of outstanding annual conferences and, during the last two years or so, a growing list of books which can be considered collective works of RC51 – where RC stands for "Research Committee" – or sub-groups thereof. To mention only two of them, one landmark is, of course, the Festschrift for Felix which was edited by Bernard Scott, Vessela Misheva, and Cor van Dijkum. A second landmark, I hope, will be for the Spanish-speaking world the book edited by Chaime which just came out: *Sociocibernética*. More projects of publications are being developed as well as concepts for joint research projects. The latter are not easy to get approved, as all of you know, but success in this field would mean another quantum leap for RC51.

We have come a long way since Bucharest and Montreal, but vast horizons and great challenges lie still ahead of us, and I am sure, we have found a good team to lead the way.

Let me also very personally thank all of you with whom I had wonderful meetings, fascinating discussions, inspiring e-mail exchanges or sometimes simply joint work on a little or big problem. Getting to know many of you through some e-mails concerning a piece of advice, an administrative

letter, or also a few reminders (!) took me many late night hours. Yet it was always very rewarding after all, when I finally met the person face to face in some conference. In Montreal I had accepted the presidency of RC51 under the condition that "it would not take too much time". Then I found that "too much time" is a very relative concept. Now, eight years later, I am very grateful to our Honorary President Felix Geyer that he convinced me to accept. It did take me a lot more time than expected, and I had not planned for two terms in office, but I find that the time was well invested, both in scientific terms and even more on human grounds.

I wish good luck, much success, and a good portion of joy to the new team, to which I will remain available as Past President. I hope that all of those who accepted their office this time will, at the end of their term, look back in a similar way.

Bernd R. Hornung  
Past President, ISA RC51

### **3. LETTER OF THE NEW PRESIDENT**

Dear Colleagues,

I write to you as the new President of RC51. First of all I wish to thank to all who supported mine and other new Board members' candidatures in the recent elections. Second, I would like to thank: our Past President, Bernd Hornung, for all he has done, as a hardworking friend and colleague, to sustain and develop RC51 over the last eight years; other Board Members for the pleasure I have had in working alongside them in my own terms as a Board Member; all other RC51 members and non-member participants in our conferences and other activities who have made my own participation so enlightening, enriching and, at times, most entertaining!

I especially wish to thank our Honorary President, Felix Geyer, not only for all he has done to develop and sustain RC51, but also for the defining impact he has had on my own life and outlook, by persuading me in 1995 and thereafter, through his example, his talks and papers, that becoming an active member of RC51 would be a worthwhile way of spending my time.

Now I wish to say a few words about my vision for RC51. I have long held the belief that the several cybernetics and systems movements that grew up in the last century have the power to enlighten and unify the disciplines and have written about this in several papers<sup>1</sup>. I have also long held the belief that holistic and global approaches are needed to address the world's many problems and, again, have written papers on this topic<sup>2</sup>. My vision for RC51 is for it to be a major contributor to both these matters: scholarly enlightenment and practical contributions to world problems, both local and global. In recent years, I have adopted two aphorisms as ways of capturing what I see as vital, complementary systemic truths pertinent for these endeavours: "There is always a bigger picture"; "There is always another level of detail." As I take on the RC51 Presidency, I find myself contemplating another systemic truth, captured aphoristically as, "There is always another perspective." I believe we can work together with shared interests and goals whilst respecting the many different perspectives we bring as individuals.

With respect to scholarly enlightenment, I believe that RC51 has three main aims: (i) to further develop shared understandings within our own sociocybernetics community; (ii) to work within the ISA to promote sociocybernetics as a fruitful unifying paradigm for the social sciences (iii) via our

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<sup>1</sup> See, for example: Scott, B. (2001). "Cybernetics and the social sciences", *Systems Research*, 18, pp. 411-420.

<sup>2</sup> See, for example, Scott, B. (2002). "Being holistic about global issues: needs and meanings", *J. of Sociocybernetics*, 3, 1, pp. 21-26.

active involvement in wider academic communities, something which I think is very special about RC51 members, to provide transdisciplinary insights and understandings that build bridges between scholars in the arts, the humanities and the sciences.

With respect to the world's problems, sometimes I am optimistic that mankind can bring harmony and lack of want to this world and that the theoretical and empirical contributions of sociocybernetics can play a key role in this. Sometimes, I am pessimistic and find myself contemplating oncoming catastrophe. Even then, as a convinced sociocybernetician, I believe that, individually and collectively, we may have the wisdom, foresight and practical knowledge and skills, rather like Noah and his arc at the time of the great flood, to become viable 'ships' in an apocalyptic sea, wise in our governance and 'self-steering'.

I am looking forward to our time together in the next four years.

With all best wishes,

Bernard Scott  
President of RC 51

#### **4. COMMUNICATIONS ABOUT SOCIOCYBERNETICS TOPICS**

##### **4.1 INTERNAL AFFAIRS**

###### **4.1.1 Election of the Board 2006-2010**

###### **Report of the Results**

*By Felix Geyer, Bernd R. Hornung, and Chaime Marcuello*

In its discussions at the Durban board meeting the outgoing board drew up a complete slate of candidates according to the RC51 statutes, par. 16a. This list of candidates, all of whom had previously agreed to their nomination and stated that they would be available in case they will be elected, was duly discussed and presented to the Durban business meeting. At the business meeting no further candidates were proposed from the floor. The subsequent Call for Nominations, which was sent by e-mail to all members of RC51, resulted in the nomination of eleven additional candidates by one of our members. As, however, none of these nominations complied with the statutes of RC51, par. 16c ("Additional candidates must be willing to serve the full four-year term if elected and must have the initial written support of at least three members in good standing."), these colleagues could not be accepted as candidates for the elections.

According to the last membership list received from the ISA Secretariat, in September we had 136 members in good standing. It turned out that at the time of the elections we could count with two more, resulting in a total of 138 RC51 members in good standing who were entitled to vote.

The electoral committee received a total of 85 ballots by email, seven of which had come from members who were not in good standing and two of which were not readable and invalid for this reason. In this way 78 valid votes were left (i.e., we had a participation of 56% of RC51 and ISA members in good standing). Such a participation in the board elections of an RC of this size is certainly decent, although a substantially higher participation would be desirable.

The very good news for all of the candidates, however, is that all of them received more than 90% of the ballots cast. This means that we now have a new board which has a very strong support among the majority of all of our members in good standing.

The complete board, however, does not only consist of those elected by the RC51 members, but also includes the new secretary, Chaime Marcuello, who, according to our statutes, was appointed by the out-going board at its Durban board meeting. Moreover, the local organizers of our annual International Conferences of Sociocybernetics and our RC 51 World Congress Programme Coordinator are members of the board by office.

A decision was taken at the Durban business meeting on two future conferences. The third one is still open, as well as the RC 51 World Congress Programme Coordinator who still has to be determined by the new board. As conference organizers, Juan Miguel Aguado will organize the 2007 conference in Murcia, Spain, and Margarita Maass Moreno, will organize the 2008 conference in Mexico City. Both are board members by office. Moreover, the Past President, Bernd R. Hornung, and, of course, the Honorary President, Felix Geyer, are members of the board.

A summary of the results is presented below. It also shows that quite a diversity of countries is represented on the new board. Nevertheless it would be desirable to have more board members and of course also many more RC51 members from Third World countries and Eastern Europe. In this, the country distribution on the new board more or less reflects the geographical distribution of RC51 members, and in particular of active RC51 members namely those who attend our conferences with some regularity.

Also, the proportion of women is certainly adequate, but not ideal. In terms of members in general RC51 has made progress in increasing the number of women among its members, in particular since the 2004 Lisbon conference.

RC51 Members in good standing: 138

(according to ISA Secretariat)

Ballots received:	85
Voters not in good standing	- 7
	<u>78 = 56% participation</u>
Not valid for other reasons	- 2
Ballots valid:	76 = 55% of entitled voters

<b>Function:</b>	<b>Name:</b>	<b>Votes / %</b>
1. President	Bernard Scott, UK	75 99%
2. Vice-President	Eva Buchinger, Austria	74 97%
3. Secretary	Chaime Marcuello, Spain	Appointed by Board
4. Treasurer	Diane Laflamme, Canada	73 96%
5. Journal Editor(JoS)	Karl-Heinz Simon, Germany	74 97%
6. Newsletter editor	Cor van Dijkum, The Netherlands	74 97%
7. Website Editor	Barry Gibson, UK	71 93%
8. Young Scientists promotion	Dario Menanteau, USA	73 96%
9. Research promotion	Michael Paetau, Germany	73 96%
10. Publications	Vessela Misheva, Sweden	70 92%
11. Journal Editor (CHK)	Soeren Brier, Denmark	74 97%

**Members by Office:**

12. Organizer 2007 Conference: Juan Miguel Aguado, Murcia, Spain
13. Organizer 2008 Conference: Margarita Maass Moreno, Mexico City, Mexico
14. Organizer 2009 Conference: To be determined
15. YEAR RC 51 World Congress Programme Coordinator: To be determined

Honorary President: Felix Geyer, The Netherlands

Past President: Bernd R. Hornung, Germany

**4.1.2 Report on the Durban Board and Business Meeting 2006 of ISA-RC51**

During the Durban World Congress of Sociology, RC51 held both a board and a business meeting with similar agendas. The business meeting was scheduled as the last event of the RC51 program on Saturday, July 29th, 2006, 16:00h – 18:00h. In spite of this unfavorable time slot, the business meeting was attended by about 30 participants.

Short reports were given by several of the board members present. The President of RC51, Bernd Hornung, then announced that the ISA had accepted the request of RC51 to establish the *Walter Buckley Memorial Award for Excellence in Presenting Sociocybernetics* as an award of RC51. It is to be awarded annually for outstanding didactical and technical quality of presenting and communicating with the audience while giving a paper in a RC51 session.

The Walter Buckley Memorial Award was given for the first time at the business meeting 2006 to José A. Amozurrutia, Centro de Investigaciones Interdisciplinarias en Ciencias y Humanidades – CEIICH, Universidad Nacional Autónoma de México, Mexico, for his paper *Sociocybernetics Applied in Cultural Activity Analysis* which he had presented in Durban in one of the RC51 sessions. This little celebration was followed by the presentation and discussion of five major topics:

- 1) Diane Laflamme, Treasurer, reported on the finances of RC51. Due to the ISA subsidy, the second installment of which was received in the interim, and due to the incoming fees for RC51 membership, RC51 funds have developed very nicely. Income from RC51 membership fees was both a result of the intensive membership drive carried out to bring the number of ISA members in good standing back to the level required to obtain the maximum number of session slots in the Durban Congress, as well as the RC51 requirement that those presenting a paper in an RC51 session at the World Congress of Sociology must be ISA members. Our new robust financial situation permits us to cover minor expenses as well as several regular payments (i.e., RC51 membership in the IFSR – International Federation of Systems Research – and bank fees.
- 2) The RC51 statutes needed updating due to some changes in ISA regulations which date back to Brisbane ISA decisions, as well as due to the practical experience of managing RC51 over the past years. Additionally, a number of minor points needing further editing. Bernd Hornung presented a revised version prepared for the meetings at the Durban Congress. The draft version to be approved in Durban was circulated on July 15, 2006 to all members who were expected to attend the Durban Congress and the RC51 business meeting. The revisions were discussed and further modified at the board meeting. The changes proposed by the board, basically editorial changes and clarifications, were accepted by the business meeting. It was understood, however, that the statutes might need some further changes which should be discussed and carried out at a later date by the new board, as a thorough deliberation of such issues was not possible in Durban.

Some particular concerns about the electoral procedure were clarified at the business meeting. It was clarified that the electoral procedure would also be subject to review once the statutes were further revised.

The revised version of the RC51 statutes as approved in Durban by the board and the business meeting still has to be sent to all members for comments and final approval. This next step in the process will be completed in the near future (TBD).

- 3) Bernd Hornung gave an account of the results of the ISA elections (i.e., the election of the new ISA President and Vice-Presidents and of the members of the new ISA Executive Committee). Regretfully, many of the candidates favored by the RC51 board were not elected. The new ISA officers include:

ISA President: Michel Wiewiorka, France  
Vice-President Research Council: Arturo Rodriguez Morato, Spain  
Vice-President Congress Programme: Hans Joas, Germany  
Vice-President Publications: Devorah Kalekin-Fishman, Israel  
Vice-President National Associations: Michael Burawoy, USA  
Vice-President Membership and Finances: Jan Marie Fritz, USA

- 4) Nominations for the new board (2006-2010), as proposed by the outgoing board, and the up-coming elections were presented and discussed. The results of the elections, which have since taken place, are presented on page 8 of this Newsletter.
- 5) The last topic discussed during the Durban World Congress was the issue of upcoming interim conferences, including the next International Conference of Sociocybernetics. The Business Meeting accepted the invitation from Juan Miguel Aguado to have the 2007 conference in Murcia, Spain, as well as the invitation from Jorge Gonzalez to return to Mexico in 2008 where Margarita Maass Moreno will serve as the local organizer. For 2009 several possibilities were discussed but a decision was not taken. At any rate, there appear to be plenty of options, in particular if the other large congresses, like those of WOSC, ISSS, ESSU or IFSR in which RC51 had become a formal member some months ago, are considered.

## 4.2 EXTERNAL AFFAIRS

### 4.2.1 Report on the RC51-Subgroup »Soziokybernetik« at the 33<sup>rd</sup> Congress of the German Society for Sociology, October 9 – 13, 2006, Kassel, established

*Michael Paetau*

Initiated by some of our German-speaking RC51-members, a sociocybernetics session at the 33<sup>rd</sup> Congress of the »German Society for Sociology« in Kassel took place. Even though the issue of social systems and social systems theory has, for many years, been a frequently discussed topic at German sociological conferences in different sociological research areas and congress sessions, this was the first time that a session was held exclusively to discuss the subject of sociocybernetics. The theme of the Congress was »Die Natur der Gesellschaft« (Nature of Society) which was a suitable motto to demonstrate the advantage of a sociocybernetic approach. Undoubtedly, the relationship between human and nature and the unity of science and humanities has been a central topic since the beginning of cybernetic thinking. We acknowledged the importance of having enough time to discuss sociocybernetic issues with the audience instead of them just listening to presentations. As such, our session had a workshop character, introduced by kickoff statements of our members, Eva Buchinger, Klaus Anders, Bernd Hornung, Karl-Heinz Simon, Michael Paetau and André Reichel as a new colleague. Together with approximately 30 attendees we had a lively discussion on two different themes: Firstly, basic questions on the sociocybernetic approach (Paetau, Hornung, Anders) and secondly, some examples of its application, like political steering (Buchinger), ecological communication (Simon) and the tension between family and employment (Anders). As a result of this meeting, the participants declared their intention to intensify the communication in German-speaking

countries (Germany, Austria, Switzerland, Liechtenstein). Naturally, all German-speaking colleagues from other countries are welcome to join this network which deems itself a German-speaking integral part of RC-51. In Kassel, we agreed upon some goals, among others, to establish a collaboration with (if necessary also a distinction from) other cybernetic communities, like »Deutsche Gesellschaft für Kybernetik«, »Gesellschaft für Wirtschaftskybernetik«, »Österreichische Gesellschaft für Kybernetik«, »Bertalanffy-Gruppe«, »Gotthard-Günter-Kreis« etc.), to intensify cooperation with sociologists working with a systems-theoretical approach in different sociological sub-communities and to look for project funding to facilitate the activities of the network.

## 5 NEW BOOK ON SOCIO CYBERNETICS

### 5.1 Sociocibernética

*Reviewed by Bernd Hornung*

Marcuello Servós, Chaime (Comp.): Sociocibernética, Lineamientos de un paradigma, Colección Estudios, Ciencias Sociales, Institución “Fernando el Católico” (CSIC), Excma. Diputación de Zaragoza, Zaragoza 2006.

*English: Sociocybernetics, Outline of a Paradigm*

*Website Publisher: <http://www.dpz.es/ifc/catalogo/buscar.asp>*

The book is a collection of twelve contributions of members of RC51 which originated in different conferences on sociocybernetics since the 1<sup>st</sup> International Conference of Sociocybernetics on the island of Crete, Greece. This collection is intended to represent in a coherent way the range of important issues of sociocybernetics as they appeared in these conferences. This reaches from methodological foundations to theory, application, and computer simulation. The latter can be considered as the genuine paradigmatic method of systems science.

The book is introduced by a reflection of the editor, Chaime Marcuello, about “The Question of Dorine”, i.e., a question asked by Felix Geyer’s wife Dorine during one of the first International Conferences of Sociocybernetics held in Panticosa in the Spanish Pyrenees: “What is the use of Sociocybernetics for normal people like me?”

This volume is the first of its kind in Spanish, in which an overall view is given of the work, concerns, contributions, use – following the question of Dorine -, and the future perspectives in which sociocybernetics of the beginning of the 21<sup>st</sup> century finds its expression.

The issues presented are:

Introduction: The Question of Dorine by Chaime Marcuello

- 1) Reflections about the Future of Sociocybernetics by Felix Geyer
- 2) The Paradigm of Sociocybernetics – Concepts for the Investigation of Complex Social Systems by Bernd R. Hornung
- 3) Complexity, Cognition, and Communication – About the Epistemological Context of Sociocybernetics by Juan Miguel Aguado
- 4) Second Order Cybernetics – A Historical Introduction by Bernard Scott
- 5) The Challenge of the Past for the Future of the Social Sciences by Cor van Dijkum
- 6) Niklas Luhmann and Sociocybernetics by Michael Paetau
- 7) Social Cohesion, Communication, and Double Contingency – The Complexity of Life in Its Multiple Cultural Possibilities by Fernando R. Contreras
- 8) The Systemic-Axiological Approach in the Study of the Social – Its Operative Possibilities by Francisco Parra Luna
- 9) Systems Thinking and Matrix Organization Oriented Towards the Construction of Social Systems – Challenges and Tools in Front of Complexity by José Antonio Amozurrutia de Maria y Campos
- 10) The Dynamics of Systems and Computer Simulation Models by Héctor Zamorano

- 11) Sociocybernetics Applied to Social Change and Development – The Case of Chile by Dario Menanteau-Horta
- 12) Sociocybernetics and Cybercultur – Perspectives, Promises, and Challenges of Interdisciplinary Dialogues by Jorge A. González

## 5.2 The Knowledge-Based Economy: Modeled, Measured, Simulated

*Announced by Loet Leydesdorff*

The Knowledge-Based Economy: Modeled, Measured, Simulated, Leydesdorff L. (2006), Universal Publishers ([www.universal-publishers.com](http://www.universal-publishers.com)), ISBN 158112-937-8

How can an economy based on something as volatile as knowledge be sustained? The urgency of improving our understanding of a *knowledge-based* economy provides the context and necessity of this study. In a previous study entitled *A Sociological Theory of Communications: The Self-Organization of the Knowledge-based Society* (2001), I specified knowledge-based systems from a sociological perspective. In this book, I take this theory one step further and demonstrate how the knowledge base of an economic system can be operationalized, both in terms of measurement and by providing simulation models.

In the first chapters, I make two theoretical steps. First, I submit that the knowledge base of an economy can be considered as an effect of the interactions between three social coordination mechanisms: economic exchange relations, political power relations, and the socially organized generation of novelty in the science system. In other words, this generalized Triple Helix model can be used as an *explanans* for the knowledge-based economy as the *explanandum*. Because the three (differently coded) communication systems can also interact, my approach takes elements from Luhmann's (1984) social systems theory, but also deviates from it. This is extensively explained in Chapter Two, where I specify meaning-processing as an operation on underlying (Shannon-type) information processing.

Meaning is provided from the perspective of hindsight, and thus the time axis is locally inverted. Knowledge can then be considered as a meaning that makes a difference from the perspective of hindsight, and thus discursive knowledge as a social coordination mechanism can be expected to reinforce this inversion of the time axis. These two levels of codifying the events along the time axis from the perspective of hindsight can be modeled using concepts like weakly and strongly anticipatory systems, respectively (Rosen, 1985; Dubois, 1998).

Weakly and strongly anticipatory systems can be operationalized by using incursive and hyper-incursive equations. In the case of hyper-incursivity, the future states of the system are considered as the independent variable. Thus, the system co-constructs its own future. I show in Chapter Four that the incursive and hyper-incursive formulations of the logistic equation enable us to model the knowledge-based economy as a regime which continuously produces sets of differently codified expectations (Leydesdorff & Dubois, 2004). These different sets have to be interfaced by organizing decisions. The decisions are shaped along historical trajectories and can thus become locked-in into sub optima (Arthur, 1994; Luhmann, 2000).

The mutual information in three (or more) dimensions enables us to *measure* the generation of negative (probabilistic) entropy within a knowledge-based system. The negative value of the probabilistic entropy indicates the inversion of the time axis quantitatively. In the empirical chapters (8, 9, and 10), this is first elaborated from the perspective of the Triple-Helix model, and then applied to the measurement of the knowledge bases in the Dutch and German economies (Leydesdorff, Dolfsma, & Van der Panne, 2006; Leydesdorff & Fritsch, 2006). Among the conclusions: high-tech manufacturing and knowledge-intensive services tend to uncouple the knowledge-based economy from its geographical dimension as a consequence of potential globalization. Regional development efforts should focus on medium-tech manufacturing.

In the final chapter, I turn to the philosophical reflection on how the knowledge base of an economy can be conceptualized as an order of expectations. Following Luhmann (1995), I use Husserl's (1929) notion of the substantivity of the *cogitatum*, that is, the subject of uncertainty of

Descartes's *cogito*. In principle, uncertainties can nowadays be measured using information theory (Shannon, 1948; Theil, 1972; Leydesdorff, 1995). Luhmann, following Parsons, added that under the condition of modernity the uncertainty in communication systems is functionally differentiated in terms of the codes of the communication. Hitherto, the Shannon-formulas have only been elaborated with the axis of time. This study adds the non-linear dynamics of meaning-processing against the axis of time, provides the relevant formulas, and shows how one could begin with the operationalization. The focus is on the knowledge-based economy, but the socio-cybernetics can also be applied to other knowledge-based (sub)systems.

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## 6. A BUCKY AWARDED PAPER

### **Sociocybernetics Applied in Cultural Activity Analysis**

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#### ***Abstract.***

In this paper I present the main criteria needed to construct a reflexive computer system from the point of view of Sociocybernetics. This construction derives from the necessity within a cultural institution to be evaluated in its procedures and, at the same time, to have better indicators to measure its activity and impact on cultural fields and society. The computer system may also be an instrument used by the institution for transforming the operative activities related to the analysis, the monitoring of new cultural projects and promoting the intelligent use of information and communication technologies. At the same time, they may be used to design and develop cultural policy.

The whole project is conceived as the interconnection of two systems: a meta-system formed by leaders of our research group and the managers and workers of the institution. The second system is coupled with the first and is formed by members of the research group and a network of computers dedicated to analyzing and evaluating a universe of around 10,000 files. Each file represents an artistic scholarship registered in several types of documents and products. Logical and physical file organization is based on specific criteria related to 25 main programs which have been operated by different working groups of the institution during 17 years of cultural activity. This system is constructed by means of the Neurofuzzy approach in order to promote permanent learning, self-reflection and self-organization.

The main claim of my proposal is to emphasize the permanent learning process involved in the *membership functions* as a presence of Fuzzy Logic. These are registered at the *perception matrix*, where axiological codes are embedded in all nuances of observables in a constant rectification by trial and error strategy of *structural coupling* with the environment. The same is applicable to the weights – in the presence of Artificial Neuronal Networks- between categories and registers at the *perception matrix* in which its agreed definition promotes permanent self-reflexivity and self-organized activities oriented to the best consolidation of the *operational closure* of the system.

#### **1. Introduction**

Defined as “System Science in Sociology and Other Social Sciences” (Hornung, 2003). Applied Sociocybernetics is a challenge in several respects. Above all it is the Structural Coupling between a research group and a client involved, that may be transformed from a traditional relation focused on commitments and based on the definition of general objectives and results, to a proposed relation with new forms of interactions in order to solve the challenges involved in a co-evolution of structural couplings between them at both working and mental levels.

On a second level, Sociocybernetics presents the challenges of constructing the *object of study* itself. It deals with the complex delimitation between the System and its Environment and the

transformation of the Observables into a Database, considering the researcher's presence, mediation and intervention in order to answer the research questions and offer a congruent solution to the real problem.

On a higher level Sociocybernetics imposes the challenge of designing an ongoing heuristic methodology that has to overcome several obstacles. As Geyer asserts: "Having a plan for an uncertain environment which will be modified when required, instead of 'sticking to the plan, whatever happens'" (Geyer, 1994). In the particular case of our research, that has to deal with a complex material inserted to multi-dimensional levels of information and involved in multiple ranges of activities. The "steer" component of Sociocybernetics "has to emphasize 'navigation' in its original naval meaning, reaching the port intended by flexibly adapting the course and the rigging to the winds and currents, instead of going stubbornly against the seas, ruining the ship" (Geyer, 1994). In our case, the main obstacles were set by the intense activity of the cultural institution that is short of workers and of space to organize a multiplicity of materials and historical files.

Complexity is a construction derived from the point of view of the project coordination. In our case, it is in terms of strong interdependent relations between the variables involved in the files to be analyzed, and in a great deal of heterogeneity in their association (i.e., artistic disciplines, program modes, type of documents, diverse physical organizational criteria, and the infinite nuances and gradation with each variable).

From here on, I propose a method to construct a computer system in which some principles of Second Order Cybernetics<sup>3</sup> are applied<sup>4</sup>. The system/environment construction is based on certain concepts of Neurofuzzy systems technologies. These systems incorporate elements of Fuzzy Logic (Zadeth, 1965) and Artificial Neural Network (McCulloch and Pitts, 1943) theories at different levels and under a specific social system perspectives (Martin del Brío and Sanz, 2002). These technologies have been used widely in the last fifteen years in engineering fields (Quantrille, 1995), in areas of research in Neurophysics and Cognition (Altrok, 1994), (Pajares y Santos, 2006), (Chorayan, 2000, 2002) and (Lee, 1996) among others, but only recently have they been introduced into Social Sciences (Siagain, 2003a, 2003b), (Situngkir, 2003), (Calventus, 2000), (Negoita, 1994) and (Martin del Brío and Sanz, 2002).

The integration of those technologies in the system construction based on Sociocybernetics and Luhmann's System Theory (Luhmann, 1970) has been proposed previously in different RC51 presentations (Amozurrutia, 2002, 2003, 2004a, 2005, 2006). In this paper I only mention the main aspects of the computer model construction because I am focusing my attention on the main challenges that Sociocybernetics faces in solving social problems.

The main directives we<sup>5</sup> apply to our socially oriented problems are:

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<sup>3</sup>We approach to construct an observing system as von Foerster (1990) proposes and enriching system attributes from Buckley (1990) and Geyer (1995) proposals.

<sup>4</sup>It is our purpose to reduce the bridge between theory and practice in Sociocybernetics as it is shown in van der Zouwen (2006).

<sup>5</sup>This Project is based on a research program at the Laboratory in Research and Development of Complex Communication" at CEIICH / UNAM, which has been developed with Dr. Jorge A. González and Dra. Margarita Mass M., both members of RC51.

- Use of “System thinking/Matrix Organization” as two interdependent activities through the entire project that led us to a Second Order Cybernetics System construction. This implies an approximation to three forms of circular causality: self-reflection, self-organization, and self-steering. The main concepts used in the cultural research project which are always related to the essential concepts in our System thinking couplings are: system / environment, elements / relations, codes / functions, structures / processes (as Structures Structuring / Structuring Structures), and stability / instability phases. All of them in an always Learning / co-evolutionary systems construction process (Amozurrutia, 2006b).
- Use of “Heuristic methodology by simulation techniques.” Besides the heuristic approximation to the project consecution, heuristic is also applied in shaping our object of study (i.e., to define the categorial structure and process to evaluate indicators and find the best outcome by trial and error, using a simulation<sup>6</sup> technique).

## 2 The Problem

The real problem originates from the institutional<sup>7</sup> necessity to evaluate cultural activity through seventeen years of work. The aim was to analyze the *efficiency* in the institution’s work and to have a measure of the *impact* of the projects on society, through creative and/or artistic activity scholarships. The evaluation should be oriented to construct better indicators to measure the inside activity and the *impact* outside, which has been subdivided in terms of *visibility* on society and *incidence* on chain values. The last indicators will show a measure of the activities and products that make the supported projects visible, and a measure of its incidence in moving other artists and professions during the scholarship as well as to measure the sources of other investments in their projects.

The files were ordered in several fashions and conditions inside 15 rooms. Each year, the institution offers several types of scholarships –that last from a couple of months, the most usual one year, but some may last for two or three years. Programs keep the documentation in files that range from a couple of documents inside a folder to several boxes for each project. We treat the file as a complex object that contains both information about the artist (i.e., proposal, curricula, some products), and information from the institution (i.e., the contract, several reports, mails and documentation dealing with the whole commitment). Each file requires anywhere from one to four hours of analysis.

### *Challenges*

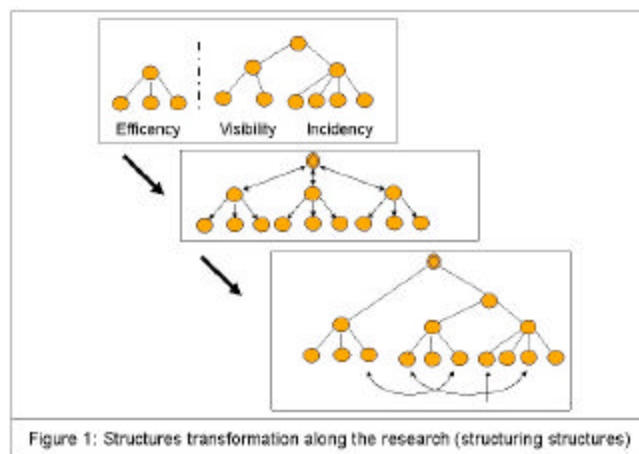
As mentioned before, one challenge was to delimitate our object of study which deals with the definition of the categories, subcategories and the variables. Each variable had a rich set of nuances. Three examples will allow us to show the dynamics in constructing our object of study:

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<sup>6</sup> Simulation techniques in Sociocybernetics have been worked in several applications (Dijkum, 2004), (Kluver and Stoica, 2003), (Goldspink, 2000) and (Zamorano, 2002).

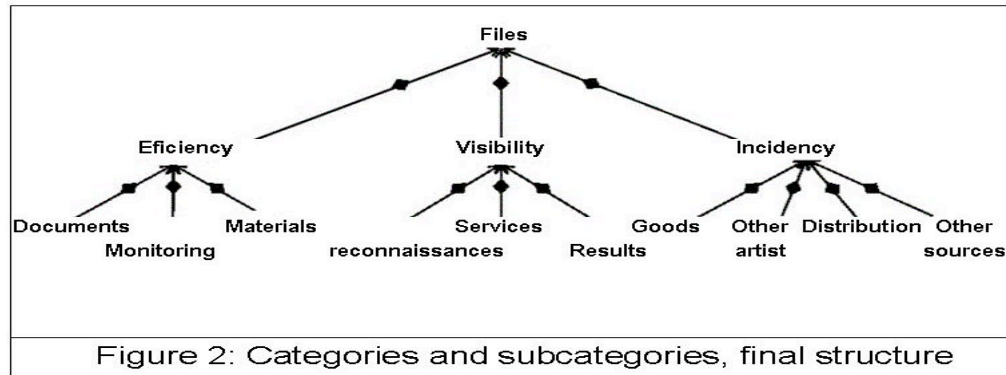
<sup>7</sup> I greatly appreciate the open mind of *Fondo Nacional para la Cultura y las Artes* (FONCA) Directives, in its collaboration on the project.

- One of the main variables was devoted to registering information about monitoring the activities through the scholarship. We started with five different options in terms of the number of partial reports completed and the existence of the final report. We finished with 21 different nuances for this project monitoring.
- We started with an official list of several types of services and goods for each artistic discipline (e.g., music, theater, dance, literature), and finally we ended with at least 20 % more, totaling to several hundred.
- The relationships between the main categories and subcategories were established through the project along three different structures in order to get the best operational results. Consequently, we had different structures and processes to calculate indicators which required three subsystem module programmed versions. It was an ongoing morphogenetic process (Buckley, 1970). See Figure 1.



In the final structure (Figure 2) the category *Efficiency* is considered a measure to provide information about the presence and organization of the project documentation, monitoring and tracking of activities and the conservation of materials. *Visibility* was related to subcategories that measure information about the artist's public reconnaissance and awards, the presence of final goods (works) and the number and type of formal performances during the period of the scholarship. *Incidence* was related to subcategories that measure the Results and Goods involved in value chains, the economic interaction promoting other artists and professionals, and the gathering of new sources of investment for their projects.

*There were challenges everywhere: taking the decision to update scheduled activities; the process of gathering and analyzing the information which was mainly 'implicit' in the document; the constant resolution of "impossibilities" of unknown information inside each file which was derived from multiple criteria and types of information from different management officers.*



The *system limits* were always expanding. Most of the time, the research team was in a “far from equilibrium situation,” working two intensive six-hour a day turns of analyst and field coordinators during four months of field research. Every day activities were included: adapting the system catalogs to incorporate new cases in order to get “the rigging to the winds and currents” of the observables and analyst/coordinators interactions; looking forward “to investigate limitations and limits of what can happen, rather than what will happen”; working with “alternative scenarios rather than with ‘predictions’”; analyzing “facilitating conditions rather than strictly causal determinants”; taking seriously the notion of ‘feed-forward’ in order to cope with some of the uncertainties in a generally uncertain world, instead of clinging to ‘central planning’, as mentioned in Geyer’s paper (1995). Heuristics emphasizes the “strategy” in its original military meaning of having a plan for an uncertain environment which was modified several times. In this phase of the project we worked hard to consolidate an always-learning activity into the group, not only with the analyst and field coordinators but also with the software programmers.

### 3. Neurofuzzy Systems in Sociocybernetics

New challenges were found when we paid attention to the nature of the evaluation. How could one built consensus codes in categories and subcategories as a system or framework axiology? How to build measure commitments, distinctions, scheduling activities and products in variables? But we delimited only distinctions outside *its artistic value*.

Qualitative analysis is the area where Neurofuzzy systems can do a good job. I would say a paradigmatic turning point is at micro-sociology. By means of Fuzzy Logic, we can transform observable nuances, sharp and subtle as the capacity and knowledge of our second order observer/constructor of the system. The first transformation is from the linguistic domain perspective to the numeric domain, a transformation that is known as *Fuzzification*. From here, by means of Artificial Neuronal Networks (ANN) concepts<sup>8</sup>, it is possible to establish equivalences with the network of categories, subcategories and variables. A function in each neuron is constructed which ponders, weighs and calculates a new value/concept in terms of the information gathered from two or more variables or subcategories, all in terms of numerical domains. Finally, in a *defuzzification* process, we

<sup>8</sup>In this model I apply *Assisted* Artificial Neuronal Network.

may again transform numerical data into linguistic information and construct the answer to the environment in its own language.

Fuzzification takes place in the first layer of the ANN and corresponds to the *dendrites* of a neuronal system. In the next layers,<sup>9</sup> the numerical outputs of the neurons are interconnected in conformity with the categorial structure and then weighted, simulating *synapses* between them. The last layer of the ANN corresponds to the output nodes of the system where defuzzification takes place in a process that can be carried out in many different forms. The simplest way is constructing a single function that converts numerical values to a graphical representation or a linguistic statement. More intelligent defuzzification is constructed by a complex algorithm design that analyzes a one-dimensional quantity which is disaggregated in several dimensions by means of Expert Systems techniques. I strongly believe that the integration of Fuzzy Logic with ANNs and Expert Systems theory is the art to convert black box First Order Cybernetic to the transparent and formal Second Order Cybernetics white box.

Inserted in a feedback cycle these three transformations promote the possibility of self-reflexivity: an operation of comparative distinction between an inner value and the last one generated by the system. Taking that difference the system decides into consideration to maintain its course within a homeostatic state, or steer its operation towards a new direction, changing its axiological codes adaptation its structure in the presence of challenges of strong irritations and perturbations from the environment (Buckley, 1970).

Fuzzification and defuzzification is done with *membership functions* -a central concept in Fuzzy Logic- and that has to be constructed for each variable in the system. Establishing correspondence between nuances of each observable and an evaluation factor, axiology takes place. In order to construct a membership function, we have to associate a numerical value of one with a statement considered as the most desirable case, and a numerical value of zero in the absence case or the most undesirable value of each variable. We can define any number of nuances between those thresholds.

Ponderation between variables takes place as an essential operation in an artificial neuron. Again, weighting two or more variables into a new variable or subcategory reveals a new presence of axiology. Assigning a different “weight” to each variable and ponderate them implies the construction of a new concept or a new category. The easiest way to do this is to ponderate several variables into a new one, generating one-dimensional values with their corresponding sentences. As previously indicated, a more creative and challenging case is to breakdown the resultant weighted into two or more dimensions, covering each element / relation with a linguistic nuance. It is the field or expert systems which deal with multi-case and conditional code.

All the factor values in membership functions and weights in the ANN may be constructed by one person or in the most desirable case by a consensus group. The system may consider several packages of factors and weights so it can evaluate the results in terms of one or another package. In the proposed model the “perception matrix” refers to the values of the evaluation factors in membership function in which are organized, and “attention matrix” refers to the values of the weights between variables and categories in which they are organized.

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<sup>9</sup> Known as the *hidden layers* in Supervised Artificial Neuronal Networks. (Martin del Brío y Sanz, 2002)

The system starts operation with initial most desirable values in the weights at the attention matrix and at least two values in each membership function, (i.e., the most and least desirable). If a couple of data is registered then it is possible to make distinctions and identify differences between most desirable value and real value in membership functions and differences between assigned/ desirable weights and ponderated real values. It is the first manifestation of circular causality that promotes self-reflexivity in the system's observer/constructor (Amozurrutia, 2002, 2006b). From here on, it is possible to change values in the perception matrix and/or the attention matrix or even transform structures and processes in order to self-organize the system. The art of self-steering may be established with the pertinent selection of groups or packages of factors and weights in perception and attention matrices.

The permanent re-constructing of an ever-learning and perfectible membership functions associated with the constant learning of assigning consensus weights in a network of neurons may be thought of as an art to approach to a complex target by trial and error in a process of constant convergence<sup>10</sup>.

From here on we can think of how to make reflexivity a permanent activity in a Second Order Observer; how we may construct an adaptative system (Buckley, 1968) that lets us develop self-reference, self-organization and self-steering (Geyer, 1970). And finally, we may better understand how to formalize this construction.

These three forms of circular causality are considered as approximations of Second Order Cybernetics applied in Sociocybernetics. In this paper I illustrate how this has been done in our project.

#### 4. The System / Environment

The computer system is delimited by two supra-systems: the presence of ideas, feelings and beliefs of the institutional group of persons, and the ideas, feelings and beliefs of the research group<sup>11</sup>. The interphase between institutional supra-system and the research group is considered as a structured coupling between them. Because we afford this coupling with a Second Order Cybernetics approach the coupling got a new path other than the traditional relationship between researchers and institutions.

We consider "the system" as composed form human activities and computer calculations. The computer system has an input subsystem for introducing a first package of perception and attention matrix values, and the observables as data. There is also a subroutine that exports information to the representation and report subsystems<sup>12</sup>. Self-reflection, self-organization and self-steering are done in a most significant way by the human subsystem, and the computer subsystem reflects them and has a parallel co-evolution on doing basic calculations (i.e., applying perception factors to data, pondering variables and subcategories, selecting packages of registers to construct dynamical and intelligent

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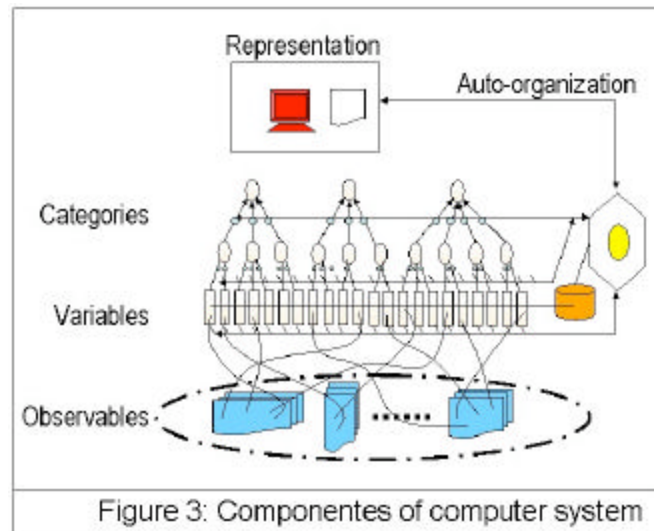
<sup>10</sup> The process of convergence in *Backpropagation* model is analog to the process to find the best values of weights in the net. Differences are the type of algorithms involved and the time cycles in each retroalimentionation. In the first case it is in millisecond and in the second in weeks.

<sup>11</sup> The team is integrated with twelve analysts, three field coordinators specialized in art, a system analyst, two programmers and three research professionals.

<sup>12</sup> Input subsystem is programmed in database software and intelligent output results are in a spreadsheet software. Both softwares allow us to modify and update coding quite efficiently.

reports). In future work we may delegate and construct modules to do more activities in self-organization cycle.

The integration of the main components of the computer system (i.e., elements /relations, codes / functions and structures / processes) is shown in Figure 3. The universe of *observables* is shown as multiples forms of organizations in files. *Variables* are shown as rectangles that correspond to the dendrites. They have inside a membership function and in the system correspond with several fields and subroutines. Most variables have a text field for analyst comments. Categories are represented in big circles and with the variables constitute the network of neurons. Between them are small circles that represent the synapses which conserve the weights. Inside them are the correspondent functions that ponderate weights. The *self-organization* module is represented by the hexagon which has several subprograms to organize and select the actual group of factors and weights depicted inside of it. Finally, the *representation* subsystem has the algorithms to convert numerical data to maps, graphs and several reports. One of them is a personalized report that uses a letter to denote the results of a project or a group of projects.



In Figure 4 we find a simplified table that represents a membership function of the dendrite. The relation between normalized factors and the fuzzy domain may be a vector, a matrix or a tensor. It represents the first level of axiological codes in relation to the observables. Each data is represented by a cardinal number that is associated with its factor and the semantic description of it. The system operates by selecting one column of the perception matrix which corresponds to the point of view of the researcher's team or any other group that participates in the system operation. It represents only the Fuzzification process as the Defuzzification process comes later in the Representation subsystem.

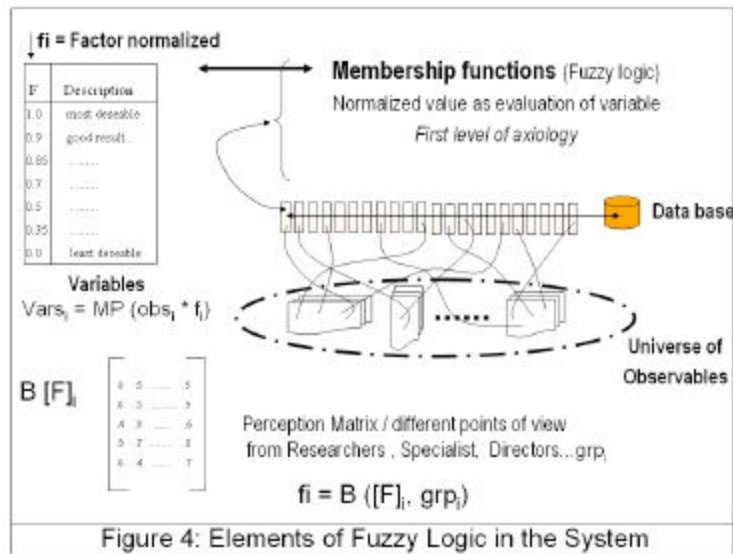


Figure 5 illustrates a simplified diagram of the network constructed with variables, subcategories and categories. The variables are not shown but are associated in different forms with each subcategory. The modalities we constructed for the attention matrix were the following:

- A group of equal weights for all programs
- A group of research team consensus weights for all programs
- A group of research team consensus weights for each program

First option corresponds to the estimation of indicators with normal frequencies. Second and third estimations correspond to weighted frequencies.

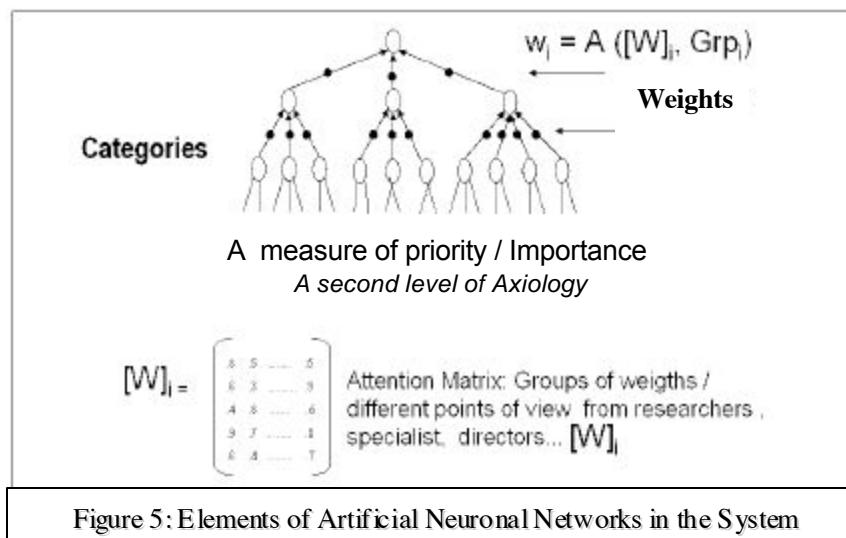
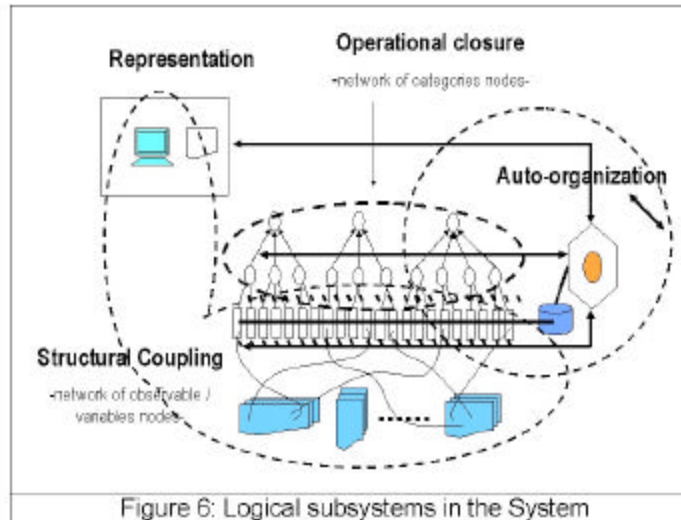
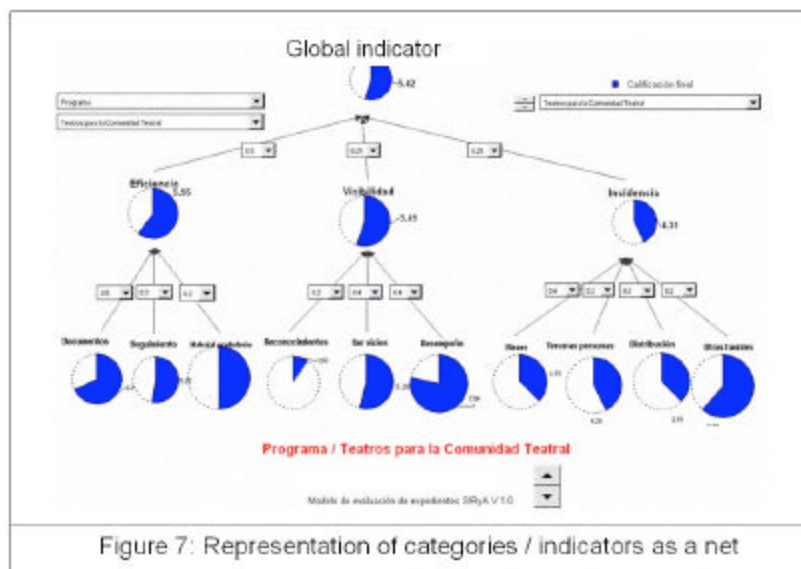


Figure 6 shows the logical components of the system. In a previous paper (Amozurrutia, 2004) I proposed a system model based on Luhmann's main concepts. I assume that the categorial network which may be enriched by the vision and mission of the whole system constitutes an *operational closure* network, where system meanings are constructed. The subsystem of variables and techniques, in this case ethnographic and documentation techniques, together with the representation subsystem correspond to the *structural coupling* of the system with the operational closure network by one side, and the environment by the other. The algorithms are oriented to maintain or change the system structure and the database and the matrix operating conditions are part of the self-organization subsystem.



Representation subsystem is part of the Structural Coupling with the environment. From different layers of the ANN the numerical values are transformed to different graphical representations (see Figure 7), or text reports (not shown). In either case the numerical values are defuzzified to the



linguistic or graphic domains by means of particular algorithms. Illustrated on the upper left corner of Figure 7 are the pull down menus to select the project or group of projects by different criteria (i.e., disciplines, programs, periods). In the upper right corner is the pull down menu to select the group of weights from the attention matrix. Each circle represents the value of the main indicators (categories) and the values of secondary indicators or subcategories.

### *Mathematical model*

The synthetic form of the mathematical model for the project is described below. The four equations are general and will adopt different forms for each index. The total numbers of equations depend on the 14 indicators, 60 variables, around one hundred values for each group of factors, and 14 values for each group of weights. The general functions are:

$$\begin{aligned}\text{Indic}_i &= \text{CP}_i (\text{Cats}_i, w_i) \\ \text{Cats}_i &= \text{CP}_2 (\text{Vars}_i) \\ \text{Vars}_i &= \text{MF} (\text{Obs}_i, f_i) \\ w_i &= A ([W]_i, \text{Grp}_i) \\ f_i &= B ([F]_i, \text{Grp}_i)\end{aligned}$$

where:

$\text{Indic}_i$  = Index of categories,  $\text{CP}_1$  and  $\text{CP}_2$  = Macro Weighted Functions

$\text{Cats}_i$  = Categories, MF = Membership Functions,  $\text{obs}_i$  = Observables

$f_i$  = Evaluation factors,  $W_i$  = Weights

A = System function to select factors set,  $[F]_i$  = Perception Matrix for evaluation factors, B = System function to select weights set

$[W]_i$  = Attention Matrix for weights,  $\text{Grp}_i$  = decisions of group

## **5. Some Conclusions**

We know that many of the activities and considerations shown can be extended to every application and not to only Second Order Cybernetics. Nonetheless, they are related to concepts, procedures and reflexivity that come *from* and can be only done with a different conception of doing sociology:

- Considering fixed time, material and human resources scheduling there are many routes to get the optimal objectives from a heuristic point of view. Efficient routes may be guided by a circular causality from permanent second order reflexivity.
- Because we know there are *perceptions and attention matrices* that always may be learning in our system, and because we know that we can make simulations of several scenarios in the proposed model, we develop higher levels of reflexivity and the self-confidence to get the results is solid and shared.
- Most important: a different sociological attitude emerges when we construct a model in a computer system that has the advantage of formalizing and showing the instrumental rationality that has led us to our conclusions (Carley, 2001).

I believe Sociocybernetics is enriching the sociological perspective by integrating new theories and techniques to construct a strong perspective in order to better understand and more aptly explain complex social problems. Geyer has pointed out that Sociocybernetics is in a “co-evolution and intensive interaction between a number of closely related fields which all represent a clearly post-Newtonian paradigm, like autopoiesis studies, complexity studies, neuronal networks...” (1995). In this paper I have shown how this last theory, coupled with fuzzy logic and expert systems strategies, can let us undertake and overcome challenges in Second Order Cybernetics.

By means of permanent learning, a trial and error strategy with a computer program as a coupled instrument with a human subsystem team, is possible to construct membership functions from fuzzy logic and the heuristic approach in finding the best suite or consensus package of weights in a neuronal network model (i.e., functions and weights as an essential concretion of system axiology). It is also possible to get specific evaluation criteria from a group of variables and get a better approximation to fit structures of integrated heterogeneity of categories through neuronal computation processes. It is a co-evolutionary process with the sensibility and rationality of team research derived from environment perturbations. All of this leads us to construct first approximations to adaptative quality of Second Order Systems, promoted by Buckley (1996).

The big challenge is to couple the research system group with the institutional group in order to construct unified meanings to the real problems and have the possibility of answering new questions.

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## 7. CALL FOR PAPERS AND ACTIVITIES

### 7.1 CONFERENCES (CO) ORGANIZED BY RC51 MEMBERS



#### 7th International Conference of Sociocybernetics TECHNOLOGY AND SOCIAL COMPLEXITY

Murcia, Spain, 18-23 June 2007

#### **CONFERENCE THEME: Technology and Social Complexity**

Technical objects (basically, instrumental machines) are crucial in everyday life. Systematic reflection about object-producing devices relates technology not only to the context of the effective production of functionally determined correlations (i.e., technology as a teleological operator) but also to subjective action. This "de-objectivizing" of technology is rooted in philosophy (e.g., Heidegger, Ortega y Gasset) and is well established in "social construction of technology" (SCOT)-approaches. It is the subject who initiates technological acts and is transformed by technological acts and, consequently, thought takes part as a technological act.

On these premises, technology presupposes technique (i.e., any systematic human action addressed to the organization and adaptive transformation of the environment) as significant human action. Technology, thus, denotes a second order operational coherence or, in other words, the organization of subjective order. Furthermore, technology refers to technical objects, but also - as a result of the epistemological extension of product - to social and cultural objects/processes, such as institutions, knowledge, identities, meanings, and more. In the very sense that technology is about order production, we could characterize systems thinking as a type of *de-objectivized technology*.

As far as it is founded on systemic premises and on the system's management of complexity, Sociocybernetics prefigures a natural conceptual and methodological space for a necessary debate on the role of technology in managing societal complexity. Technology enables the social system to cope with environmental complexity and increases its internal complexity. It also increases and diversifies the complex nature of the interdependence of society and individual actors, as well as new problems arising in the sphere of psychic systems (e.g., identity narratives, emotions). Simultaneously, the increasing societal complexity demands new forms of technology to be designed and implemented. In one way or another, technology is in the background of any relevant discussion on the contemporary nature of society, both on the side of problems (e.g., risk, control and global surveillance, bio-ethics and bio-engineering, media manipulation, ecology) and on the side of putative solutions (e.g., instant communications, ubiquity, accessibility, safety, knowledge availability).

Papers are welcome dealing with technology and complexity both in concrete aspects related to everyday life in contemporary societies as well as from conceptual and holistic points of view. With reference to the theoretical background of RC51, the role of technology in the coupling of social and individual systems will be of special interest.

#### **VENUE AND ACCOMMODATION:**

Los Alcazares. Murcia- Spain. *See map below.*

Los Alcazares is an old town (from the Arabian Xth Century "Al'Ksar" –The Fortress-) by the Mar Menor, a salt lake close to the Mediterranean Sea which has been a recreational site since the Roman Empire.

The closest airport is *San Javier Airport*, which is located on the northern shore of Mar Menor, at a distance of 1 km from Los Alcazares. It offers both flights to the principal Spanish cities and regular

or charter flights to other European airports. If coming by plane, you can also use the *Alicante (El Altet) Airport*, 68 km from Los Alcazares, 45 minutes away by motorway. Los Alcazares may also be reached by bus from Murcia and from Alicante. The nearest train station is *Balsicas-Mar Menor* (half-way on the Murcia-Cartagena line ); from there you should take a taxi to Los Alcazares (15-20 min.). *Hotel facilities are being negotiated. Additional information will be forwarded at a later date.*

**CONDITIONS OF PARTICIPATION:**

To present a paper, membership in RC51 is preferred.

*Conference fees include:*

- RC51 non-members : EURO 100
- RC51 affiliated members (non-ISA): EURO 50
- RC51 regular members in good standing (ISA and RC51): No fee

*In special cases (e.g., students) exemptions can be granted upon request.*

The fees can be paid on the spot or by bank transfer (in Euros and with all charges to the participant).

Bank transfer to: Bernd R. Hornung Ref.: SOCIOCYBERNETICS  
Account no. 39 72 049 02, BLZ 533 400 24  
IBAN: DE55 5334 0024 0397 2049 02  
SWIFT Code, BIC: COBADE FF 533  
Commerzbank  
Bahnhofstr. 2  
D-35037 MARBURG, Germany

**SESSIONS AND LANGUAGES:**

The official languages of the conference will be English and Spanish. A specific session in Spanish will be organized for this conference. However, in order to facilitate the review process and communication among participants, all abstracts are to be in English. Final papers in Spanish should, therefore, include an English version of the paper title and abstract.

**ABSTRACTS AND THE REVIEW PROCESS:**

*Abstracts* for papers should be 500 to 1000 word *detailed abstracts* for the review process and the definitive assignment to a particular session. In addition, 250 word *regular abstracts* are needed for publication on our website. All abstracts should be sent to the Chair of the Abstracts Committee, Eva Buchinger <eva.buchinger@arcs.ac.at>, to Juan Miguel Aguado <jmaguado@um.es>, and to the President of RC51, Bernanrd C. Scott <b.c.e.scott@cranfield.ac.uk>. The Abstracts Committee will review the detailed abstracts and will make acceptance decisions. In some cases, the Committee may suggest improvements and modifications, in order to ensure compliance with the conference theme. Abstracts have to deal with one or more of the major subjects mentioned above and should fit well with the overall theme of the conference.

**DEADLINES:**

January, 15, 2007: Declaration of intent  
February, 20, 2007: 500-1000 word *detailed abstracts*  
April, 14, 2007: Notification of acceptance  
May 2<sup>nd</sup>: 250 word *regular abstracts*  
May, 17, 2007: Definitive registration and booking  
June, 10, 2007: Full paper

**CONTACTS AND INFORMATION:**

*For any further questions and information you may consult the RC 51 website at <http://www.unizar.es/sociocybernetics/>. You may also directly contact any of the members of the International Organizing Committee or the chairman of the National Organizing Committee.*

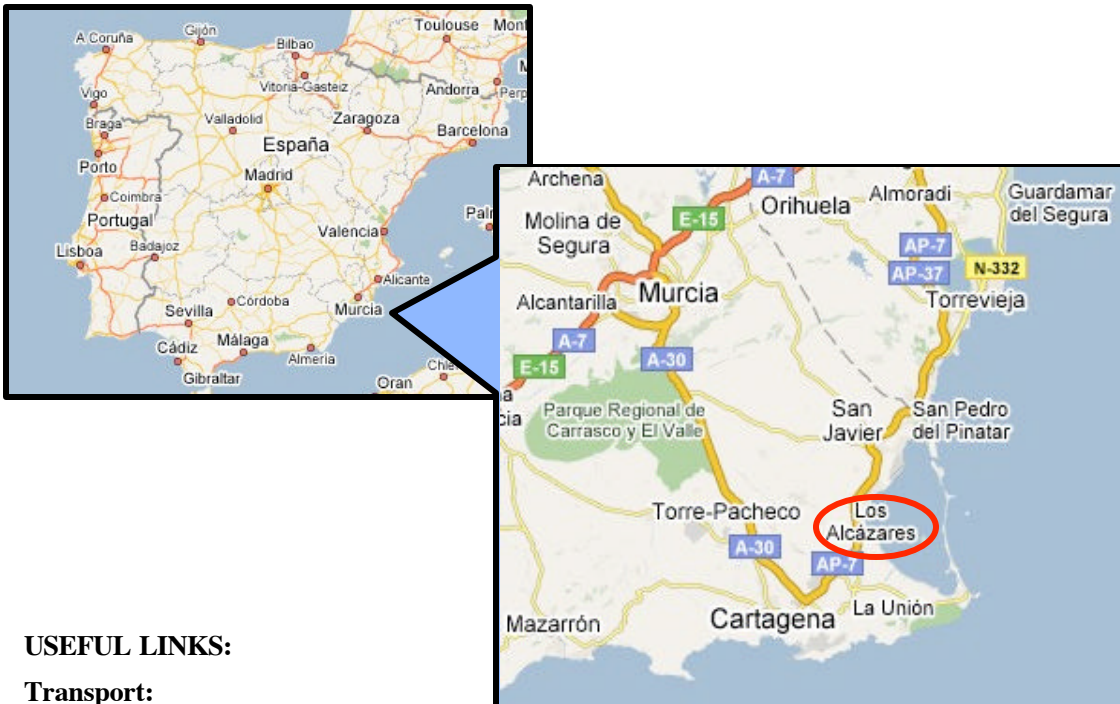
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Juan Miguel Aguado [jmaguado@um.es](mailto:jmaguado@um.es);  
Tel.: + 34 968363850; Fax: + 34 968367141

**LOCATION:**



**USEFUL LINKS:**

**Transport:**

BUS MURCIA-AEROPUERTO DE SAN JAVIER. Web: <http://www.latbus.com>  
BLUE LINE. Web: <http://www.flyblueline.com>  
BRITISH AIRWAYS CITIEXPRESS. Web: <http://www.britishairways.com>  
BRITISH MIDLAND BABY. Web: <http://www.bmibaby.com>  
EASYJET. Web: <http://www.easyjet.com>  
EXCEL AIRWAYS. Web: <http://www.xl.com/>  
FINNAIR. Web: <http://www.finnair.com>  
FLYBE. Web: <http://www.flybe.com>  
GB AIRWAYS. Web: <http://www.gbairways.com>  
IBERIA. Web: <http://www.iberia.es>  
JET2. Web: <http://www.jet2.com>

MONARCH ARL. Web: <http://www.flymonarch.com>  
MY TRAVEL LITE. Web: <http://www.mytravellite.com>  
NORWEGIAN AIR SHUTTLE. Web: <http://www.norwegian.no>  
RENFE (TRAIN) Web: <http://www.renfe.es>  
RYANAIR. Web: <http://www.ryanair.com/>  
SAS. Web: <http://www.sas.se>  
TUI AIRLINES BELGIUM. Web: <http://www.tuijetair.be>  
VIRGIN EXPRESS. Web: <http://www.virgin-express.com>

**Destinations, cities and University:**

LOS ALCAZARES TOWN (MAR MENOR): <http://www.ayto-losalcazares.es/>  
TOURIST INFORMATION: <http://www.murciaturistica.es>  
MURCIA UNIVERSITY: <http://www.um.es>  
FACULTAD DE COMUNICACIÓN Y DOCUMENTACION: <http://www.um.es/f-comunicacion>

*If you do not intend to join the discussion in Murcia, please forward the information to your friends and colleagues, whom you find able and interested to contribute.*

**Conference : Methodologies of Systemic Theory, Empirical Research and Form Analysis**  
**Place: IUC, Dubrovnik, Croatia, April 2. – 6. 2007**

**Theme**

Niklas Luhmann's system theory has a tremendous impact on social studies. Luhmann's "Grand Theory" got its final form with his principal work *Die Gesellschaft der Gesellschaft 1 – 2* in 1997, though additional books, articles and interviews have been published. Whatever one thinks about the exact form of his analysis, sociological theory has to some extent been transformed by the "Luhmann effect." Although Luhmann's general theory is very abstract and distanced whenever he does not enter his own analyses of semantic differentiations, his methods of analysis are used more and more in empirical studies. The very abstract character apparently has a fruitful effect. New questions can be posed as to how seemingly normal and natural objects emerge, how they are codified, what forms are attributed to their communication, and so on. Since the theory is empirically open, new semantics, different codes, and changing forms turn out to change and develop structures at higher levels.

The conference may include the following questions and topics: Which forms do codes have if subjected to semantic change, and how do codes get resistant forms? Analyses of semantics, of forms, of codes, of systems of differentiations, of structural couplings between different subsystems are to be discussed. All kinds of topics are subjects for systemic studies, from pedagogy, art, and religion to social research, organization, law, politics and international conflicts. The conference will continue this ongoing work and gather scholars who work with methodological clarifications as well as empirical studies. Studies comparing system analysis with other forms of analysis are welcome (e.g., Foucauldian, Bourdieuan or analysis of discourse and discourse-ethics). The language will be English although some papers might be held in German.

Deadline for *papers* to the programme is **26 March, 2007** by which time we can still send papers to the participants. In order to prepare the programme, establish workshops, and so on, *abstracts*, should be sent to the coordinator (Gorm Harste, Department of Political Science, Aarhus University, Denmark, [gha@ps.au.dk](mailto:gha@ps.au.dk)) not later than **31 January**. It is not obligatory to send an abstract or to present a paper in order to participate in the conference, but you are requested to send an e-mail well before March 26<sup>th</sup> to announce your participation. In the case of too many subscriptions, priority will be given to those who present papers.

### Organizational Background

Every second year conferences about the use of Luhmann's system theory have been held in Munich, Copenhagen and Tromsø. Here, especially the link between Bielefeld-Berlin-Copenhagen, has strengthened the network. The Scandinavian and British internetwork have developed fruitful discussions in which German and Dutch scholars have also contributed. Translations of Luhmann's books are increasingly numerous, and introductions and theoretical contributions are flourishing. The same seems to be the case with empirical studies applying system theory in comparative studies, case-studies, historical studies or in concrete practice. An increasing number of scholars from France, Italy and the United States have participated. Some of the current debates take place at the following websites:

([http://uk.groups.yahoo.com/group/luhmann\\_danish/](http://uk.groups.yahoo.com/group/luhmann_danish/))  
 (<http://groups.yahoo.com/group/sociocybernetics/>).

In the 1980s, Hans-Ulrich Gumbrecht and Ludwig Pfeiffer organized a number of great conferences at the Inter-University Centre of post-graduate studies (IUC) in Dubrovnik in the former Yugoslavia, now Croatia. Luhmann had attended these conferences since 1981. Unfortunately, the Centre was bombarded in 1991 and for some years the conferences could not take place. The contributions from those conferences were published in a series of five rather large volumes at the important Suhrkamp Verlag (*Der Diskurs der Literatur- und Sprachgeschichte*, 1983; *Epochenschwellen und Epochenstrukturen im Diskurs der Literatur- und Sprachgeschichte*, 1985; *Stil*, 1986; *Materialität der Kommunikation*, 1988, *Paradoxien, Dissonanzen, Zusammenbrüche*, 1991). A number of these studies were dedicated to semantic history and contributions to a system theory of art.

Today, the Centre—and its spirit— have been completely restored. It currently offers convenient Internet facilities and a number of rooms for study and for accommodations for a fee of 35 Euros (2006). See [www.iuc.hr](http://www.iuc.hr) for details . The Centre is located very close to the famous medieval city of Dubrovnik, approximately 300 meters northwest of the city center. You can find accommodations in one of the many hotels in Dubrovnik, and you may want to consider the following options: Hotel Imperial is the closest to the Centre, but expensive; Hotel Lero is cheaper, and about 1½ km from the Centre, or private accommodations or rooms ( "Sobe") which are very economical and can be found everywhere; Note on Private Rooms, when the airport bus stops, people will come and offer you private accommodations. Restaurants and cafés are everywhere. The weather in early April is normally sunny and 15-24 C° though rain is not improbable.

The Dubrovnik airport is situated about 20 kilometres South of Dubrovnik. Please keep in mind that the conference takes place in the first week of Easter, thus it is a good idea to book reservations in time. Travel by car and ferryboat is somewhat more complicated, albeit beautiful.

### Course directors:

Gorm Harste (Aarhus University)	<a href="mailto:gha@ps.au.dk">gha@ps.au.dk</a>
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## 7.2 OTHER CALL FOR PAPERS AND ACTIVITIES

### **SASO 2007, International Conference on Self-Adaptive and Self-Organizing Systems** *USA, Boston, Mass., USA, July 9-11, 2007*

The complexity of current computer systems has led the software engineering, distributed systems and management communities to look for inspiration in diverse fields (e.g., robotics, artificial intelligence or biology) to find new ways of designing and managing networks, systems and services. In this endeavor, self-organization and self-adaptation have emerged as two promising facets of a paradigm shift.

Self-adaptive systems work in a top-down manner. They evaluate their own global behavior and change it when the evaluation indicates that they are not accomplishing what they were intended to do, or when better functionality or performance is possible. Self-organizing systems work bottom-up. They are composed of a large number of components that interact locally according to simple rules. The global behavior of the system emerges from these local interactions, and it is difficult to deduce properties of the global system by studying only the local properties of its parts.

This edition of SASO will focus on engineering, as opposed to speculative and conjectural visions. Contributions should present novel theoretical results, or practical experience with building systems, tools, frameworks, etc. Contributions contrasting different approaches for engineering a given family of systems, or demonstrating the applicability of a certain approach for different systems are particularly encouraged.

Important Dates:

Submission: January 31, 2007

Notification: March 19, 2007

Final paper: April 6, 2007

Website: <http://projects.csail.mit.edu/saso2007/>

### **Dynamics Days Europe**

*UK, Loughborough, Loughborough University, July 9- 13 July 2007*

Dynamics Days Europe is a series of annual international conferences founded in the 1980s that provides a European forum for developments in the theory and applications of nonlinear dynamics. For over twenty years it has been bringing together researchers from a wide range of backgrounds including physics, mathematics and biology for interdisciplinary research in nonlinear science.

The 27th Dynamics Days Europe is a joint venture between Loughborough University and the University of Nottingham. The meeting will take place at Loughborough University from the morning of Monday 9 July 2007 to lunchtime on Friday 13 July 2007.

There will be ten plenary talks, each of which is associated with a minisymposium. Contributed talks in these and any other areas of nonlinear dynamics are welcomed. We are also soliciting proposals for special themed sessions of contributed talks.

Important dates:

Deadline for abstract submission: 5 April 2007

Deadline for registration at the lower rate: 5 April 2007

Website: <http://www.lboro.ac.uk/departments/ma/ddays/>

**11th World Multi-conference on Systemics, Cybernetics and Informatics**

*USA, Orlando, July 8 – 11, 2007*

WMSCI 2007 is an international forum for scientists and engineers, researchers and consultants, theoreticians and practitioners in the fields of Systemics, Cybernetics and Informatics. The forum focuses into specific disciplinary research, and also in multi, inter, and trans-disciplinary studies and projects. One of its aims is to relate disciplines, fostering analogical thinking and, hence, producing input to the logical thinking.

Keynotespeaker (among others): RC51 member Prof. Stuart A. Umpleby

Deadlines:

January 10th, 2007: Submission of brief abstracts (100-400 words), extended abstracts (400-2000 words) or paper drafts (2000-5000 words).

January 10th, 2007: Invited Sessions proposals. Acceptation of invited session proposals will be done in about one week of its registration via the respective conference web form, and final approval will be done after the registration of at least five papers in the respective session

February 10th, 2007: Notifications of Acceptance.

March 1st, 2007: Submission of camera-ready papers: hard copies and electronic versions.

Website: <http://www.iiis-cyber.org/wmsci2007/website/>

**The 3rd Iasme / Wseas International Conference on Energy, Environment, Ecosystems and Sustainable Development**

*Greece, Agios Nikolaos, Crete Island, July 24-26, 2007*

The IASME / WSEAS Int.Conf. on energy, environment, ecosystems and sustainable development (EEESD'07) is organized every year by WSEAS with great success. The conference offers to the Engineers and Scientists from various areas a unique forum for exchanging ideas, presenting recent research results, participating in discussions for several research projects and establishing new academic collaborations and linking university with the industry. In the conference, many civil engineers, architectural engineers, environmental engineers, chemical engineers, scientists working on physics applications, mechanical engineers, electrical engineers, applied mathematicians will attend creating a world gathering as in 2005 and 2006.

Deadline for paper submission: March 31, 2007

Website: <http://www.wseas.org/conferences/2007/greece/eesd/>

**The 17th Annual International Conference of the Society for Chaos Theory in Psychology & Life Sciences**

*USA, California, Chapman University, Orange, July 27-29, 2007*

The Society for Chaos Theory in Psychology and Life Sciences is a multidisciplinary organization, and its conferences present work in all areas of psychology, general biology, neuroscience, medicine, and the social sciences, as well as anthropology, art, education, literature, mathematics, philosophy and physics. The program will include workshops, invited addresses, symposia, panel discussions, a poster session, and sessions of individual papers. Advances in basic or applied research, developments in theory, reports of empirical results and methodological papers are all welcome. We continue to encourage all nonlinear scientists, including graduate students who might be finishing up a dynamical thesis or dissertation, to consider sharing their ideas through paper presentations, chairing a roundtable session, or by proposing other alternative presentation formats, such as posters, product demonstrations, short workshops, or debates around controversial topics.

The deadline for submissions is April 29th, 2007.

Abstract can be submitted electronically by visiting:

<http://www.societyforchaostheory.org/conf2007/cfp>

**The 51th Annual Meeting of the International Society for the Systems Sciences**

*Japan, Tokyo, Tokyo Institute of Technology, 5-10 August 2007*

Under the theme “Integrated Systems Sciences: Systems Thinking, Modeling and Practice”, the 51st annual meeting of the ISSS will be held in Tokyo, Japan from August 5 to 10, 2007. It attempts to promote systems sciences as an approach to complexity in a broad sense, identified in organizations, communities and societies, and their environments, in such a holistic and integrated way that we draw on all of systems sciences from systems thinking and systems modeling to systems practice.

Important Dates:

March 1, 2007: The deadline for panel, workshop and stream proposals.

May 31, 2007: The deadline for full papers.

(Late papers received after May 31, 2007 may still be accepted to the conference, but they are included on the CD-ROM proceedings for the subsequent year.)

June 1, 2007: The deadline for abstract submission.

Website: <http://www.iss.org/conferences/tokyo2007/>

**8th International Conference CASYS'07 on Computing Anticipatory Systems,**

*Belgium, Liège, August 6-11, 2007*

Symposia on Anticipatory Systems, Incursion, Hyperincursion, Predictive Models, Mathematical Modelling, Chaos Theory, Dynamic, Logic And Control Systems, Gnitve And Neuronal Brain, Mind, Consciousness, Intention, Education, biological and medical systems, genetics, evolution, ecology, and environmental models, risk management, economical systems, social models, operations research.

Abstract Submission as soon as is possible on-line at CASYS'07:

<http://www.ulg.ac.be/mathgen/CHAOS/CASYS.html>

Deadline for draft full paper: June 1, 2007

**8th ESA Conference: Conflict, Citizenship and Civil Society**

*Scotland, Glasgow, September 3-7, 2007*

ESA is an academic association of sociologists and a non-profit Europe-wide association comprised of over 700 members. It was established in 1992, following deliberations and consultations among sociologists from a diverse range of countries.

Europe is in the midst of massive changes, including the transformations in east and central Europe and the increasing integration of the European Union. Sociology has much to contribute to European level debates and developments. The ESA has an important role to play in organizing the European debate and setting the agenda.

The provisional deadline for abstract submission is 15th February, 2007

Website: <http://www.esa8thconference.com/>

**Political Linguistics**

*Poland, Poland, September 13-14, 2007*

In recent years, 'political-linguistic' studies have been drawing on increasingly bigger empirical input from the neighboring domains, including linguistic pragmatics, critical discourse analysis, social psychology, sociology and anthropology. Our conference, the first international event of its kind and scale in central/eastern Europe, comes as a response to this trend.

It aims at convening scholars from a wide range of disciplines, interested, broadly speaking, in the rich and heterogeneous but thus yet to become better demarcated area of intersection of language/discourse and the political sphere (i.e., politics, both in its institutionalized and everyday dimensions). The general purpose is to explore and deepen ways of analyzing language as a political instrument, a political theme, and a political domain.

Individual papers (20 min. paper / 10 min. discussion) and workshop proposals are invited. Abstracts (300-500 words), with the author's name, affiliation, e-mail address, and paper title should be sent electronically by the end of February 2007 to the address [pl2007@ils.uw.edu.pl](mailto:pl2007@ils.uw.edu.pl). Notification of acceptance will be sent to the authors by 31 March 2007.

Website: <http://www.ils.uw.edu.pl/pl2007/>

**2007 IEEE International Conference on Systems, Man, and Cybernetics  
Smart Cooperative Systems and Cybernetics Advancing Knowledge and Security for Humanity**  
*Canada, Montreal, Quebec, The Delta Centre-Ville, October 7-10, 2007*

The 2007 IEEE International Conference on Systems, Man, and Cybernetics (SMC 2007) provides an international forum that brings together those actively involved in areas of interest to the IEEE Systems, Man, and Cybernetics Society, to report on up-to-the-minute innovations and developments, to summarize the state-of-the-art, and to exchange ideas and advances in all aspects of systems engineering, human machine interface, and emerging cybernetics.

The conference theme recognizes that current progress in Systems Science and Cybernetics have resulted in vast advances in cooperative systems of systems that are able to work together, sharing information and joint decision making using smart technologies such as, but not limited to, intelligent computational tools. Such systems are already used in serving the global community need for information dissemination and securing the welfare of humanity. Papers related to the conference theme are especially solicited, including theories, methodologies, and applications of intelligent systems in science, technology, security, education etc.

Contributions covering industrial issues/applications and academic research are invited.

**Important Dates:**

Thursday, February 1, 2007: Deadline for submission of proposals for special sessions

Thursday, March 1, 2007: Deadline for submission of papers (full-length papers only)

Tuesday, May 15, 2007: Notification of acceptance

Tuesday, July 3, 2007: Submission of final camera-ready papers

Website: <http://www.smc2007.org>