

# JOURNAL OF SOCIOCYBERNETICS

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Volume 4

Number 2

Fall/Winter 2003-2004

*Official Journal of the Research Committee on Sociocybernetics  
(RC51) of the International Sociological Association*

# JOURNAL OF SOCIOCYBERNETICS

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The **JOURNAL OF SOCIOCYBERNETICS** (ISSN 1607-8667) is an electronic journal published biannually--Spring/Summer and Fall/Winter--by the Research Committee on Sociocybernetics of the International Sociological Association.

**MANUSCRIPT** submissions should be sent electronically (in MSWord or Rich Text File format) to each of the editors: Richard E. Lee [rlee@binghamton.edu](mailto:rlee@binghamton.edu) and Cor van Dijkum, [c.vandijkum@fss.uu.nl](mailto:c.vandijkum@fss.uu.nl). In general, please follow the Chicago Manuel of Style; citations and bibliography should follow the current journal style (APA). Normally, articles should be original texts of no more than 6000 words, although longer articles will be considered in exceptional circumstances. The Journal looks for submissions that are innovative and apply principles of General Systems Theory and Cybernetics to the social sciences, broadly conceived.

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**SOCIOCYBERNETICS** traces its intellectual roots to the rise of a panoply of new approaches to scientific inquiry beginning in the 1940's. These included General System Theory, cybernetics and information theory, game theory and automata, net, set, graph and compartment theories, and decision and queuing theory conceived as strategies in one way or another appropriate to the study of organized complexity. Although today the Research Committee casts a wide net in terms of appropriate subject matters, pertinent theoretical frameworks and applicable methodologies, the range of approaches deployed by scholars associated with RC51 reflect the maturation of these developments. Here we find, again, GST and first- and second-order cybernetics; in addition, there is widespread sensitivity to the issues raised by "complexity studies," especially in work conceptualizing systems as self-organizing, autocatalytic or autopoietic. "System theory", in the form given it by Niklas Luhmann, and world-systems analysis are also prominently represented within the ranks of RC51.

The institutionalization of sociocybernetic approaches in what was to become RC51, the Research Committee on Sociocybernetics of the International Sociological Association, began in 1980 with the founding of an ISA Ad Hoc Group and proceeded with the organization of sessions at succeeding quadrennial World Congresses of Sociology. The eventual RC51 became a Thematic Group and then a Working Group. Finally, in recognition of its extraordinary success (growing from some 30 members in early 1995 to 240 in 1998), the group was promoted to the status of Research Committee at the 1998 World Congress of Sociology in Montreal.

Over these past two decades, sociocybernetics has attracted a broad range of scholars whose departmental affiliations represent the entire spectrum of the disciplines, from the humanities and the social sciences through the sciences, mathematics and engineering. Furthermore, the many countries of origin of these RC51 members attest to the wide international appeal of sociocybernetic approaches. Within this highly diverse community, there is wide agreement on some very general issues, for instance, on developing strategies for the study of human reality that avoid reification, are cognizant of the pitfalls of reductionism and dualism, and generally eschew linear or homeostatic models. Not surprisingly, however, there are also wide divergences in subject matter, theoretical frameworks and methodological practices.

Many have argued that models developed for the study of complexity can be usefully appropriated for the study of human reality. Moreover, however, the emphasis in complexity studies on contingency, context-dependency, multiple, overlapping temporal and spatial frameworks, and deterministic but unpredictable systems displaying an arrow-of-time suggest that the dividing line between the sciences and the historical social sciences is fuzzier than many might like to think. What is more, in the humanities, the uniquely modern concepts of original object and autonomous human creator have come under serious attack. The coincidence of these two phenomena substantiate the impression that across the disciplines there may be observed a new concern for spatial-temporal wholes constituted at once of relational structures and the phenomenological time of their reproduction and change.

In this context of rich history and exciting possibilities, the Research Committee on Sociocybernetics of the International Sociological Association extends an open invitation through the **Journal of Sociocybernetics** to all engaged in the common quest to explain and understand social reality holistically and self-reflexively without forsaking a concern for human values--human values not construed simply as a matter of individual ethics, but conceived as an integral part of a social science for our time.

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## NOTE FROM THE EDITOR

This issue of the *Journal of Sociocybernetics*, Volume 4, Number 2, marks the end of the present editor's tenure. Beginning with Volume 5, *JoS* will be in the able hands of Bernard Scott (thus all manuscripts should be submitted to him at [B.C.E.Scott@rmcs.cranfield.ac.uk](mailto:B.C.E.Scott@rmcs.cranfield.ac.uk)). We wish him all the best, and assure him our complete support, in this exciting venture.

# FORMS OF MEANING IN HOMELESS PEOPLE'S RESPONSES TO THE OHIP-14 QUESTIONNAIRE: AN EXPLORATORY QUALITATIVE STUDY

**Barry Gibson, Qiling Huang, Blanaid Daly, and Jane Gregory\***

In response to changing concepts of health, traditional clinical measures, which have an emphasis on disease, have been increasingly supplemented by multidimensional socio-medical measures of health. These measures emphasize physical, psychological, and social well-being (Locker 1992). Like the measurement of health, the measurement of oral health should not be focused on just the body but on the individual and the way in which disease affects health, well-being, and the quality of life (Locker 1997). A range of socio dental indicators have been developed and are now in use in dentistry (Cushing et al. 1986; McGrath 2002; McGrath & Bedi 2001). Most significant is the Oral Health Impact Profile (OHIP), which was directly based on a conceptual model developed by Locker (1988). The OHIP consisted of 49 questions and was subsequently shortened to the OHIP-14. The OHIP-14 has in turn been used in a number of studies and has demonstrated high stability, internal consistency, good construct and discriminant validity (Locker & Slade 2003; Slade & Spencer 1994). It was also sensitive to the detection of short-term change in quality of life after clinical treatment (Awad et al. 2000). The changing nature of the underlying meaning of quality of life was nonetheless discussed as one of the key problems in relation to its measurement (Allison et al. 1997).

Mallinson has suggested that studying how people respond to quality of life instruments might go a long way to shedding "light on the way in which respondents interpret questions or their intended meaning when they select a response". In a qualitative study of assessment of SF-36, Mallinson interviewed a group of older people face-to-face without in-depth probing in order to explore their interpretations of the questions. Problems ranged from simple technical aspects of question construction, such as double questions, vague questions, and unfamiliar

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We would like to thank the participants in this study for their co-operation. We would also like to thank Professors Tim Newton, Peter Robinson, David Locker, and Loet Leydesdorff for their kind help with previous versions of this manuscript.

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terms, to problems with the conceptual basis of questions and how these related to participants' conceptions of health. Some questions had normative assumptions and were not relevant to some people; others demonstrated adaptation and response-shift even during the process of filling out the same questionnaire. Finally some people held several different concepts of health (Mallinson 2003).

Such problems could generate uncertain data, high rates of missing data, and under-estimations of the impact of disease. Without more assessment of peoples' understandings of survey questions, even the validation of the most widely used health status questionnaire could fail to identify some important problems. More comprehensive qualitative validation research is therefore needed to explore the interpretation of such questions within different social groups (Mallinson 2003). This research along with other work suggests that a more reflexive approach to quality of life measurement is emerging (Locker & Allen 2002; Allison et al. 1997; Sprangers & Schwartz 1999).

Reflexivity is of course already well established in qualitative research where it refers to the development of accounts which reflect tracing the distinction between first and second order observation (Denzin & Lincoln 2000). The goal of such an exercise is often to trace which concepts and statements are generated from the participant and which are generated from the researcher. The work of Mallinson (2003) as a second order observation of statements attempting to make sense of a questionnaire is similar. Reflexivity, however, can also refer to the broad social processes associated with modernity (Beck et al. 1994; Leydesdorff 2003). In this respect it could be argued that there are controlling mechanisms that are acting beyond the research encounter and which in turn determine its specific character (Leydesdorff 2003). It is important to keep sight of such mechanisms. This involves looking closely at how knowledge is generated. Here one perspective argues that originally all knowledge exists in the

form of ideas or memories, that is to say, patterns of activation in the brain. In order to test the adequacy of that knowledge, it needs to be exteriorised, 'brought out into the open', where it can be studied and analysed by a group of observers, without having to depend on the idiosyncratic form and associations it had in the mind of the person who originally 'discovered' the piece of knowledge (Heylighen 1999).

The process of exteriorizing knowledge and giving it an explicit form with an unambiguous meaning is called formalization (Heylighen 1999). Formalization can be given several meanings from the strict adherence to conventions to the more specific meaning in science and philosophy denoting a rule-based system of symbolic expressions. In such systems the truth of those expressions is generated, in principle at least, according to internal rules or axioms and not any external denotation. The work presented here follows Heylighen by stating that "an expression is 'formal' when it has an invariant meaning. 'Expression' denotes an external representation, with a stable, recognizable form, of some internal thought, observation or piece of knowledge. 'Invariant' signifies that the meaning of the expression will not change when the same expression is used at different times, in different situations, or by different people, that is to say in different contexts" (1999). Heylighen moves away from seeing the formalization of thoughts in a dichotomous way (i.e., either the thoughts are formal or not) to seeing expressions in terms of the degree to which they are formal (on a continuum). In the empirical

sciences there is a need to test whether an expression is adequate for the phenomena represented. This requires an operation or test of adequacy, a further system of rules, referring to a situation external to the expression itself (1999). Such rules are operational and in turn they lead to rules of method.

In questionnaire research establishing the degree of formalism depends on how well questions can evoke an expected range of responses from the flux of human experience. To be valid the range of responses should conform to a standard range of expected responses. Too much variability leads to questions about whether or not the responses, which are being aggregated, actually mean the same thing. Assessing the validity of responses means developing a method (itself a set of rules) or system of observation that can rigorously observe questions and responses in a way which is itself relatively invariant.

The OHIP-14 questionnaire emerged from a similar process of exteriorization (Locker 1988) as a standardized way to measure the impact of oral conditions on aggregates of people. The emergence of such measurements reflects a change in the way that the impact of health care is evaluated. As stated above reflexivity involves not just reflecting on processes of exteriorization and how these emerge in the research encounter they also involve making sense of how the research encounter itself relates to broader social processes. The aim of this paper is to report the development of one methodological approach to the study of the mechanisms underlying the measurement of the impact of oral conditions on the quality of life. The implications of this approach for a more reflexive understanding of the role (*and function*) of quality of life assessment will be further outlined in the discussion.

## **METHODOLOGICAL ORIENTATION**

This study was based on the radical constructivist approach of von Förster (1981) and Glasersfeld (1995). As an epistemological position this fitted well with the problem of emergent knowledge (Heylighen 1999). In order to provide some way to reflect on the broader implications of quality of life assessment this epistemological approach was developed in association with elements of Luhmann's general theory of social systems (Luhmann 1993; Luhmann 2002). Luhmann (1995) argued that there were three basic types of social system, communications, interactions, and organizations. Additionally, in this theory there is an important distinction between social systems (communication) and psychic systems (people). Social systems operate through communication whereas psychic systems operate through consciousness. The implication of this is that social and psychic systems cannot communicate directly with each other. Therefore, in an interview the researcher and participant cannot read each other's minds, they can however read each other's communications.

It is this gap that leads to an ongoing and emergent 'pressure' to communicate. The different range of understandings that people bring to an encounter produces the pressure for interaction. Once interaction begins it very quickly feeds on different understandings, the ways in which participants choose to communicate and the ways in which they understand the information and utterances provided. This is why social systems are said to contain the components to produce themselves. It is why Luhmann chose to call them 'autopoietic' systems

(Luhmann 1995). Within this framework a number of assumptions have to be made. First, we cannot 'know' or have *direct* access to the thoughts of participants. Second, the only access we can have to their thoughts is indirectly by reading what they say. Third, we are accessing what they say under the rather artificial arrangement of a particular type of interaction system—the research interview. Fourth, OHIP-14 questions will form part of the environment of the research interview and will therefore be the dominating feature of the interaction. The OHIP-14 should therefore be seen as a special kind of, albeit inflexible, observer. Fifth, the use of OHIP-14 indicates that we will be looking to see how the participant has understood the question and if they have replied, by making indications that are relatively invariant. How we will be establishing this is by looking to see if they have the same 'form of meaning' as that implied by the question. In other words the responses should be indicating the same thing in the same way that is 'expected' by the questions. What follows is an outline of what we mean by the 'form of meaning'.

Luhmann was influenced by George Spencer-Brown (Spencer-Brown 1969). This influence means that underlying Luhmann's approach is a theory that all communications are formed on the basis of drawing a distinction. Drawing a distinction involves selecting what something means to the person and then uttering it by making an indication. This perspective is compatible with that of Heylighen (1999) mentioned earlier since what someone knows about the current interaction is emergent. Indications of the meaning of something for someone further reduces the complexity of the interaction by reducing the range of future things on which meaningful communication can proceed. In short, it reduces the interaction into manageable chunks.

Selections of meaning can be mapped in their relationships with each other. In other words their form can be analysed. The relationships between the indications in an utterance will be known as the form of meaning. The form of meaning is therefore the totality of all the indications in a statement or utterance in relationship to each other. By developing a system of notation based on The Laws of Form we can observe the forms of meaning of statements in the interview as expected by OHIP-14. We can therefore establish whether or not these 'match' those made by participants as they decide which indication to make. The details of this notation method are given in the data analysis section below. In many senses this study aimed to establish whether or not the meaning of the items on OHIP-14 corresponded to the forms of meaning indicated by homeless participants communications about what these items meant to them. Secondary to this is an analysis of how the OHIP-14 works to produce stabilised sets of indications.

## **MATERIALS AND METHODS**

The study was conducted in three hostels and two day centres with homeless people who were being treated by community dental services. In total 31 participants agreed to take part in the study; there were no refusals. The aim of the data collection was to gather unprovoked responses to the OHIP questionnaire as the homeless participants attempted to fill them out. Participants were interviewed face-to-face by the interviewer in hostels or day

centres during their dental check up. They were allowed to complete the questionnaire without interference. The responses were not probed in any depth. All interviews were therefore tape-recorded (even when there were no responses) and subsequently transcribed for data analysis at a later stage.

## **DATA ANALYSIS**

### **Interpretation of OHIP-14 questions**

The form of meaning of each OHIP-14 question was represented according to the system of notation outlined in the 'Laws of Form' (Spencer-Brown 1969). The system of notation is not used with the same degree of formality as The Laws of Form but rather as a form of logical analysis. The system of notation is being used to arrange the relationships *between* the indications made by homeless people as they talk. In the Laws of Form the statements *a* and *b* and when *a* is said to *imply* *b* are logically related and presented in Figure 1.

This system of notation can be used to produce the general form of meaning in all OHIP-14 questions. When someone makes an indication on an OHIP question it is assumed that they are making the same form of indications that the questions imply. That is that the person is making an indication about their oral health, which includes an impact, a cause that produces this impact, and a frequency. So, for example, question one in OHIP-14 states "Have you had trouble pronouncing any words because of problems with your teeth, mouth, or dentures?" The participant is required to tick a box indicating that they have had an impact that has either conformed to this form or not. This indication is given by marking the frequency of the impact over a reference period (usually six months). The only exception to this is question three (Figure 2).

### **Analysis of the meaning of responses**

Using the same systems of indications the form of meaning of each incident (i.e., each set of comments made by participants) that emerged during the interviews was identified. At times this would involve showing how the form of meaning changed. After the final form of meaning indicated by what the person said was presented, this form was then compared with that of the OHIP-14 question. Where the final incidents had similar forms of meaning, these were grouped together and termed confirmation of meaning. In some cases where participants did not produce all three elements in their responses it was suggested that partial confirming had occurred. By comparing the meaning of the responses and the meaning of the questions, the emergence of incidents where confusions occurred could also be identified. Contradictory meanings also emerged during the data analysis and these were illustrated by comparing the meaning of answers within the same interview. Details of each of these are given in the results section.

## Results

In total, thirty-one homeless people took part in the study producing 434 answers, 77 (17.7%) of these answers produced observable comments and discussion. Within these 77 comments, two (2.5%) were unintelligible because of background noise and had to be ignored. The rest of the incidents were grouped into three main categories:

*Confirming* – participants confirmed that either they had or had no impact.

*Confusion* – the form of meaning of the response was different to the form of meaning of the question.

*Contradiction* – participant made conflicting forms of meaning in their answers i.e. not inconsistent forms.

Some contradictions emerged from different answers between two OHIP questions and thus resulted in two incidents. For this reason the total number of incidents was more than the number of comments; in total, there were eighty incidents of verbalization leading to confirmation, confusion and contradiction (Table 1). From these data more than one-third (28, 35%) of the incidents where there was some discussion of the responses to the question resulted in a final statement that displayed a similar form to the form of meaning of the questions. Other incidents (25, 31.2%) where there was some discussion of the responses to the question resulted in a partial confirmation of the meaning of the question. Partial confirmation of the meaning of the question was where the participant did not present all of the necessary components of the response expected for confirmation. There were two (2.5%) incidents which confirmed no impact through a process of normalization; normalization occurred when the participant stated that whilst they did have an impact that it wasn't really an impact because everyone would expect to have an impact of some sort.

Of the eighty incidents, eight (10%) resulted in either confirmation or denial of the impact after a process, which indicated that the participant did not understand the question and had sought and received clarification. This process was termed either confirmation or rejection of the impact after a 'confusion'. Five (6.2%) of these incidents resulted from the participant having a different understanding of the meaning of the impact; one (1.2%) had a different understanding of the meaning of the frequency; and two (2.5%) were confused about whether the impact was generalized or specific in meaning.

Confusion occurred in ten (12.5%) incidents. Three of them emerged when there was confusion in relation to the nature of the cause. There were three (3.7%) incidents in which confusion emerged in relation to the nature of the impact and four (5%) incidents demonstrated not only confusion but also irrelevancy.

There were seven (8.7%) incidents where contradictory forms of meaning emerged. In three (3.7%) of these incidents contradictions emerged whilst the person was answering the same question; another three (3.7%) emerged over the course of discussions about the appropriate responses to different questions. Finally there was one incident in which contradiction occurred in both the same question and a different question. What follows is a summary of how each of these emerged in the data.

*Complete confirming*

Complete confirming represents an ideal form of answer to the questionnaire without generating any problems, not only confirming an impact, but also stating a time and frequency for when the impact happened. In the case of confirming no impact, the participant would in turn have denied each of these three elements.

**Q7. Has your diet been unsatisfactory because of problems with your teeth, mouth, or dentures?**

**JC:** Whatchamacallit yeah, of course. 'cause I can't eat nothing whatchamacallit with these teeth, because they are that loose, and whatchamacallit it affects the teeth every time I try to start to eat something. You know what I mean?  
(Incident 1. JC 24/03/03)

In this example, participant JC confirmed the impact simply but completely by illustrating the impact, the cause, and the frequency (Figure 3). During complete confirming some participants would also communicate additional layers of meaning.

*Partial confirming*

Sometimes not all elements of the question would be presented. There were three forms of partial confirming: (a) partial confirming through impact and cause without frequency; (b) partial confirming through impact; (c) partial confirming through cause. The following incident provides an example of partial confirming. Participants confirmed impact and also presented the problems that caused the impact. They did not however state the frequency verbally (Figure 4).

**Q12. Have you had difficulty doing your usual jobs because of problems with your teeth, mouth or dentures?**

**AO:** Yeah, I usually, I'm a butcher by trade and the fairground comes as a secondary job, yeah, I can't work around people they tend to put me back of the shop because of my bad breath.  
(Incident 3. AO 10/03/03)

In this example, participant AO presented the cause of the impact, which was his bad breath, and described how his job was affected, but did not clarify the frequency verbally. The form of meaning was therefore incomplete and partially confirmed (Figure 4).

*Confirming through normalisation*

Normalising referred to incidences where a possible impact was seen as part of everyday life and therefore not of any significance. Normalising was then used to deny and thus confirm no impact.

**Q13. Have you felt that life in general was less satisfying because of problems with your teeth, mouth, or dentures?**

**EJ:** No, I suppose. You take it as sort of 6 of one and half a dozen of the other.

**I:** you take life is 6 of one ...?

**EJ:** life is 6 of one and half a dozen of the other more or less.

(Incident 6. EJ 17/03/03)

In this example, EJ indicated how he thought the effect of oral health caused problems in his life. By stating that its '6 of one and half a dozen of the other', which is similar to 'this is life'. In other words his life was not affected by oral health problems because they were normally expected in everyday life (Figure 5).

*Confirming after confusion*

Confusions occurred when participants indicated that they understood the question in a different way from what was implied. Confusions emerged in three different ways: through a different understanding of the meaning of the impact, the meaning of the impact in a general or specific way, and the meaning of frequency. Confusions could often be resolved after a short discussion with the interviewer. In the following example confirming occurred after confusion in the meaning of the impact had been resolved by the interviewer sharing her understanding of the meaning of the question. Participants often accepted this selection of meaning and the confusion would be resolved. This process of sharing could therefore lead to either a negative or positive confirming.

**Q2. Have you felt that your sense of taste has worsened because of problems with your teeth, mouth, or dentures?**

**No. 44:** I'm not quite sure about this one, have you ever felt about the sense of taste.

**I:** The taste you get from food has that changed?

**No. 44:** Probably not, no.

(Incident 8. No.44 12/05/03)

The participant indicated some confusion over the meaning of 'sense of taste'. The interviewer then clarified the meaning by presenting her perspective. The difference between the form of meaning of the question and the participants understanding of this form of meaning was then resolved and the participant confirmed no impact.

In all cases confusions led to difficulties in establishing if there was an impact or not. As we have seen in the previous section this was often resolved through discussions with the interviewer. Some confusion nonetheless could remain. There were three types of confusion:

Confusion related to the cause;

Confusion related to the impact;

Confusion related to the relevancy of the item.

*Confusion of cause*

Confusion of cause emerged when people clarified the cause of an impact. Because the OHIP questions were only concerned with the problems related to the mouth, if there were other problems that could cause the same impact, participants could become confused as to whether or not the impact existed.

**Q6. Have you felt tense because of problems with your teeth, mouth, or dentures?**

**No. 18:** I just want to go out and hit something.

**I:** that because you felt tense?

**No. 18:** No, I'm serious I just want to get the cunts back that did this to me, you know, I'm sorry but that's the way I think, you know.

(Incident 18. 17/03/03)

According to the dentist the participant had been a victim of a violent assault which had resulted in his teeth being broken. The assault was the initial cause of his problem yet his indications about what this meant to him included a hidden cause—crime. Confusion thus emerged between his experience of crime and the broken teeth. The problem with regard to different meanings was whether he felt tense because of the impact of the crime or the broken teeth or both? This question remained unresolved (Figure 7).

*Confusion related to the irrelevancy of the item*

At times participants were confused by the lack of relevance of some of the items. This confusion could be resolved through the illustration of the interviewer's perspective, otherwise could lead to possible false negative result.

**Q7. Has your diet been unsatisfactory because of problems with your teeth, mouth, or dentures?**

**CHC:** I haven't had a diet at all. It says has your diet been unsatisfactory because of problems with your teeth, mouth or dentures? I've never been actually had a diet, cause I've never been in a situation where I've been told to diet. So, just been no really...

**I:** Er, have you found that...Em...any food that you'd like to you haven't been able to eat because of teeth or dentures?

**No. 22:** No, not really.

(Incident 22. 17/02/03)

In this example the participant was confused about what diet was referring to and eventually denied the impact after clarification from the interviewer. The result of the different meaning

selection led to the emergence of confusion. From another point of view, confusion in this case not only confused the participant, but also indicated that the question wasn't relevant to this person (Figure 8).

**Q12. Have you had difficulty doing your usual jobs because of problems with your teeth, mouth, or dentures?**

**No. 23:** I'm not working at this moment.

**I:** Ok.

**No. 23:** you know when you are walk down the road and you meet a nice girl, I can hardly smile at them.

**I:** OK. So probably that would be never then.

**No. 23:** I don't know...

**I:** That's a difficult one, have you had difficulty doing your usual things...

**No. 23:** Yeah. You know I mean I walk around smiling; I can't any more with this.

**I:** Yeah. Ok. So that's probably very often then again.

(Incident 23. MM 17/03/03)

Clearly the term 'job' had a range of meanings in language. It could be defined as a task or piece of work, but could also refer to paid work. When 'paid work' was selected as the appropriate meaning of the question, it did not fit the role of homeless people. In some respects the interviewer had to bend the meaning being indicated by the question to better fit what they thought it might mean to a homeless person (Figure 9).

*Contradictions*

Contradictions occurred when participants would often demonstrate conflicting perspectives on the meaning of an impact. It emerged when participants confirmed or denied an impact at first, but their subsequent narratives or discussion indicated an opposite meaning. There were three types of contradiction:

Contradiction in the same question;

Contradiction resulting from different questions;

Contradiction in both the same question and different questions.

Even though some contradictions could be resolved through discussion with the interviewer, there remained a number where possible false negative results might be observed. This hinted at the existence of latent impacts. Contradictions indicated the particular way in which the participants' perspectives on oral health were not stable and kept changing from time to time. The different indications that participants could select would often clash with each other whilst they were answering the same question.

**Q7. Has your diet been unsatisfactory because of problems with your teeth, mouth, or dentures?**

**EJ:** Er, I can't eat apples any more.

**EJ:** Because the teeth are loose. When I eat an apple suddenly it loosen some more than...

**I:** Ok. What would you decide for your diet? Would you decide occasionally, fairly often or very often?

**I:** apples, when you talk about the apples, what did you decide with the best answer, occasionally, fairly often or very often?

**EJ:** I don't bother eating apples any more. It won't bother me never any more.

**I:** Right. Ok. So, if it won't bother you eating any more, then it's never now, isn't it?

**EJ:** Yeah.

(Incident 26. EJ 17/03/03)

In this example the participant began by confirming that his diet had been affected. After the interviewer required him to give the frequency of the impact, he indicated that he avoided apples. His subsequent response indicated that he had been avoiding apples for some time and thus he did not have a latent impact. The contradiction between feeling an impact and then rationalising it into a non-frequency (because he avoided apples) led to what we term as a 'latent' impact. It could also show that he adapted to the situation (Figure 10).

Contradictions in participants' responses could also emerge when answers to different questions were compared.

**Q2: Have you felt that your sense of taste has worsened because of problems with you teeth mouth, or dentures?**

**No. 43:** Yes

**I:** And would you say that is occasionally, fairly often or very often?

**No. 43:** Sometimes.

**I:** So occasionally.

**I:** So how would you notice that taste is changed.

**No. 43:** Sometimes I wake up in the morning and I like to drink water and there is pain you know.

**I:** It's sensitive?

**No. 43:** Yes.

**Q3: Have you had painful aching in your mouth?**

**No. 43:** No.

**I:** No painful aching? No pain?

**No. 43:** Yes of course pain definitely sorry.

**I:** Ok and you are having that quite a lot?

**No. 43:** Yes.

**I:** So that's fairly often?

**No. 43:** Yes

(Incident 29. No.43 12/05/03)

Although there was some confusion in his answer, he actually confirmed another impact which

related to the following question. When he went on to answer this question (question 3), he did not indicate that the impact existed and as a result a contradiction emerged. The contradiction was eventually resolved after the interviewer probed further (Figure 11).

## **Discussion**

In a conventional sense the findings of this study appear to confirm the effectiveness of OHIP-14 at reproducing responses that have the same form of meaning as those intended. Of the total number of responses (434) only seventeen (3.9%) resulted in some degree of observable confusion or contradictory response. The problem is we were using an approach that involved only recording unprovoked responses. Therefore, we cannot be sure just how accurate this figure is in relation to the extent of confusion and contradictions in the responses as a whole. Participants may well have been confused or perhaps just did not care enough to make comments about how they understood the questions. It is likely therefore that the figure of 3.9% represents the lower boundary of confusion and contradiction.

Of the observable incidents 21.2% resulted in forms of meaning indicating that some confusion and contradictions remained, even after discussion with the interviewer. Once again the problem with this figure is that it is derived only from observable incidents. It is impossible to say that some form of conscious occurrence might have taken place after the last observable utterance, which might in turn have reduced the proportion of confused responses recorded. It is therefore suggested that the figure of 21.2% might represent the upper limit of contradictions and confusions in the study.

Since these results are taken from a very specialized group, the findings are not generalizable. They do, however, show how the OHIP-14 operates within a very different social psychological context. The importance of doing this work is clear. The OHIP-14 is a shortened form of the OHIP-49 which was developed from data collected in a very different population (Allen & Locker 2002; Locker & Slade 1993; Slade & Spencer 1994). There was a need to assess if there were going to be problems with the meaning of the questions in this population. Accordingly, this study explores the validity of homeless participants responses to the OHIP-14 by developing a method of assessing the degree to which the form of responses to questions match the expected form of response. In this sense, then, the study approaches the issue of validity by assessing the degree to which the meaning of responses are invariable, that is, that they refer to the same things in the same way as the OHIP-14 'expects' (Heylighen 1999).

The method does more than assess the validity of OHIP-14 in this population, especially when considered within the context of the general theory of social systems. As verbalizations are analyzed we can see how the fluid nature of participants' responses changes. These changes occur when the researcher and participant confront the rigid questionnaire observer (OHIP-14) and try to decide on the meaning and understanding of questions. During the correspondence it is clear that the research encounter 'functions' to reduce the complexity of the person's account of their experience to correspond to the form of response expected by the questions. The method of breaking up the forms of meaning in communications about responses to questionnaires might provide a useful bridge between the sorts of qualitative

assessments of validity like that of Mallinson (2003) and the quantitative nature of questionnaire data. In addition to this, further questions ought to be considered. Is for example, an upper limit of 21.2% of incidents of confusion and contradiction acceptable? How could the degree of confusion and contradiction be reduced?

Other methods of data collection could have been adopted. Some researchers ask participants to reason their responses out loud (Mallinson 2003). It was decided that this would be too artificial and might negatively affect the relationship between the researcher and participants. The findings nevertheless raise the issue about how OHIP-14 questionnaires should be completed (i.e., either self-completed or completed in interviews). Previous research in a population of patients attending an accident and emergency dental service has indicated that the self-complete method of administration yielded more incomplete and unusable questionnaires. Although there were no significant differences in oral health related quality of life scores (Robinson et al. 2001). There are, however, no data comparing different methods of administration for homeless participants. The results of this study also suggest that it might be fruitful to explore similar studies within a broader population group.

In theoretical terms the application of Luhmann's (1995) general theory of social systems indicates a number of additional points, which are worth considering. Luhmann's approach includes a move from an action-centered framework to an interaction-based framework (Leydesdorff 2003). This entails focusing on how and why communications like those in this study occur. It also forces us to consider how the original knowledge formalization by Locker (1988) was picked up by oral health systems to subsequently structure how the interactions took place in these interviews. As can be seen the dynamic of this process of exteriorization was achieved through the production of a stabilized researcher observer—the OHIP-14 questionnaire. This observer was then placed in a position to interact with homeless participants in the research encounter.

For Luhmann, interaction was considered the basic operating mechanism for generating meaning in social systems (Leydesdorff 2003). By using his framework we are able to combine elements of the interactionist tradition with the analytical power of systems theory. In this case the interaction between homeless participants' perspectives was 'structured' by the form of each question. In short the questionnaire 'expected' certain responses from a range of possible responses. What is more, the questionnaire operated to stabilize responses within certain 'horizons of meaning'. This then facilitates the aggregation of responses so that further second order analyses can be made.

The framework also demonstrates how the structuring of research encounters like these can contribute to the broader discourse on the application of quality of life assessments. In this respect the framework "allows for formalization without losing the relation to the interactive accounts" (Leydesdorff 2003). From the point of view of reflexivity the observations of the OHIP-14 refer to a theory about possible observations to be expected when people are asked about the impact of oral conditions (Locker 1988). The method developed here allows what is observable to be evaluated in relation to these theoretical expectations.

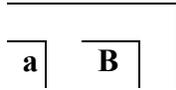
The results of this study also suggest that research encounters can refer back to the oral health system. For example, by indicating the degree to which various oral conditions impact on homeless people. Such reporting back can serve as the basis for oral health systems to

respond to what is going on in their environments. In Luhmann's theory of social systems operations like the research encounter presented here serve the function of enabling health systems to become 'structurally coupled' with their environments (people). This occurs in much the same way that price specifications communicate an expected market value and thereby speed up the economic transaction process by organizing communications in an organized and functionally codified format. It is suggested that quality of life instruments function to codify the impact of dental conditions and therefore serve to speed up the self-reference of dental systems as they aim to monitor their operations.

Finally, it has been established (McGrath and Bedi 2001; Allison et al. 1997) that health systems are no longer observing their operations in terms of disease processes but *also* in relation to communicating how these processes impact on psychic systems. The change in the form of self-reference reflects a broader process of differentiation of health systems. It is important to see functional differentiation as something that precedes language structurally (Leydesdorff 2003). In this respect quality of life indicators are a semantic reflection of the underlying process of functional differentiation. Why this has happened or what it means in relation to the 'differentiation' of health systems ought to form the basis of further work.

**FIGURES AND TABLES**

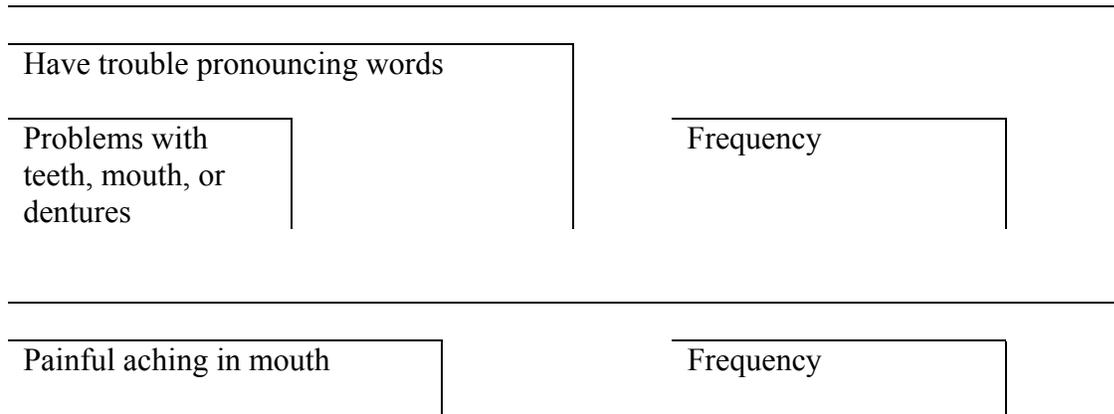
**Figure 1. The statement 'a and b' in the Laws of Form**



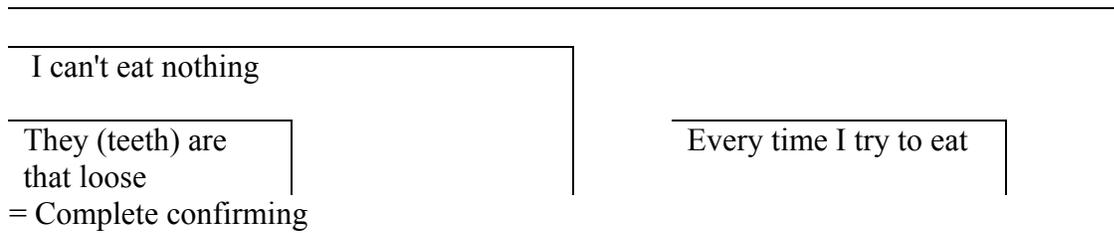
The relationship between 'a implies b' in the Laws of Form

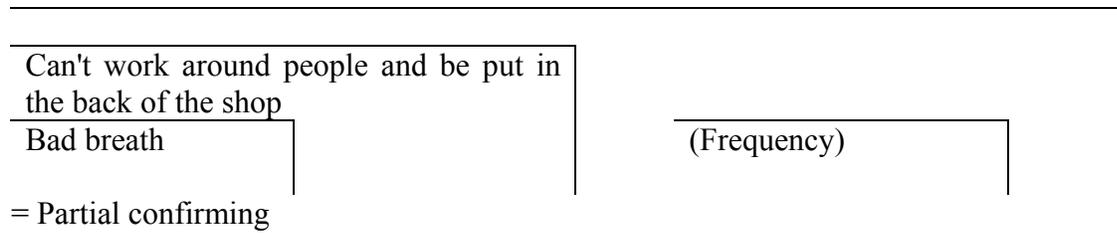
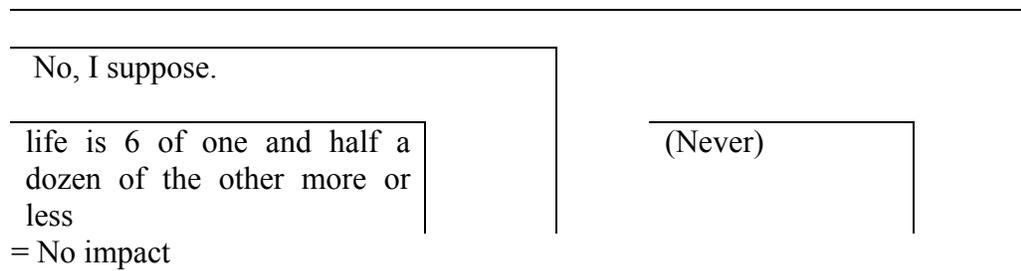
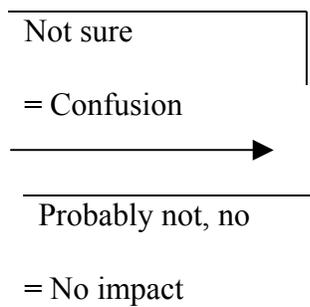


**Figure 2. The form of meaning of questions one and three in OHIP-14**

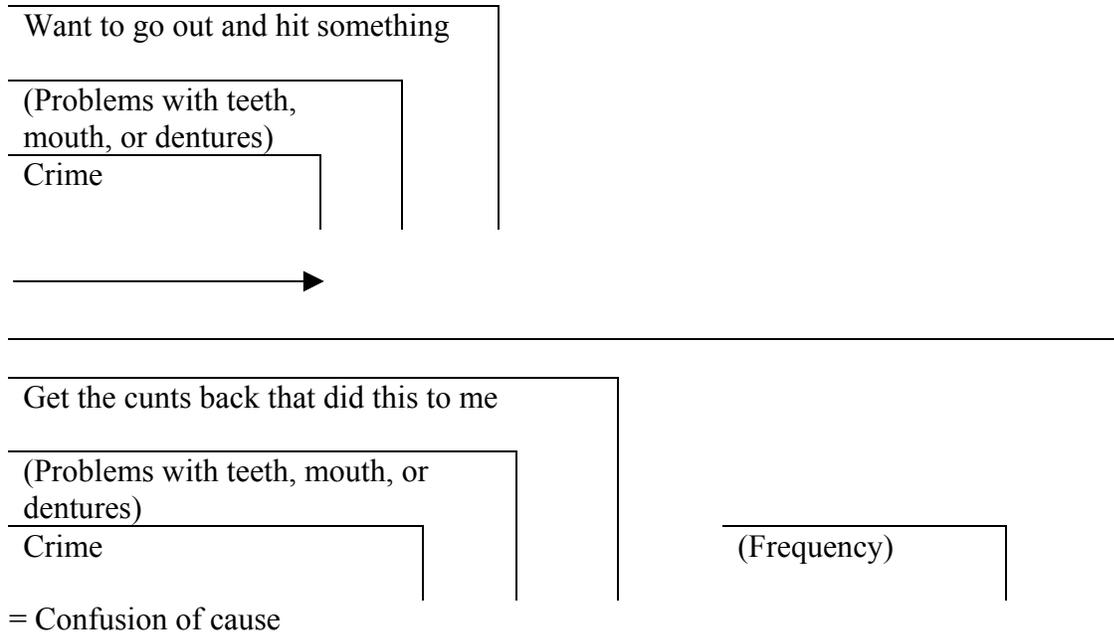


**Figure 3. The emergence of complete confirming in incident 1**

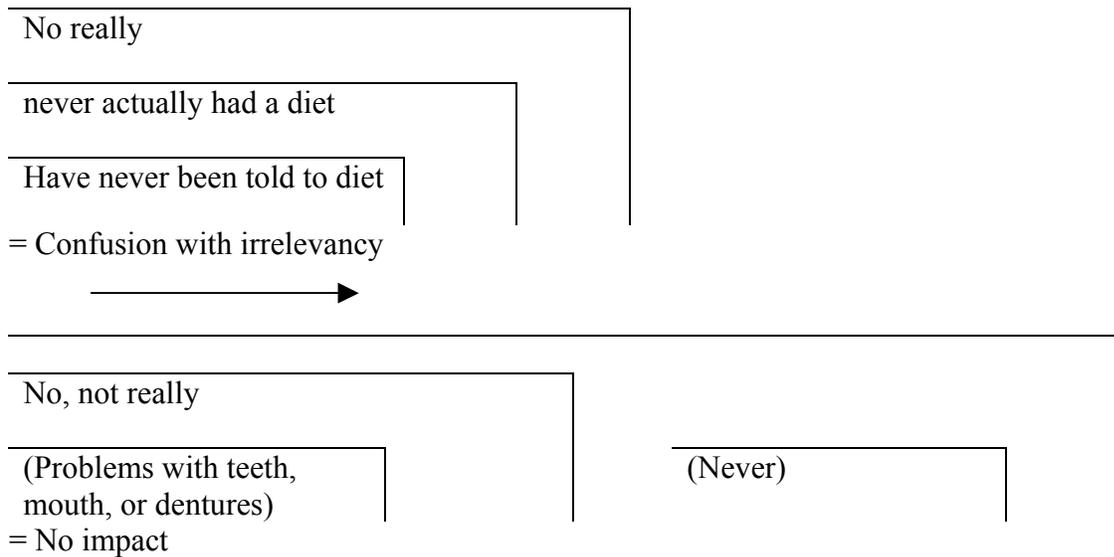


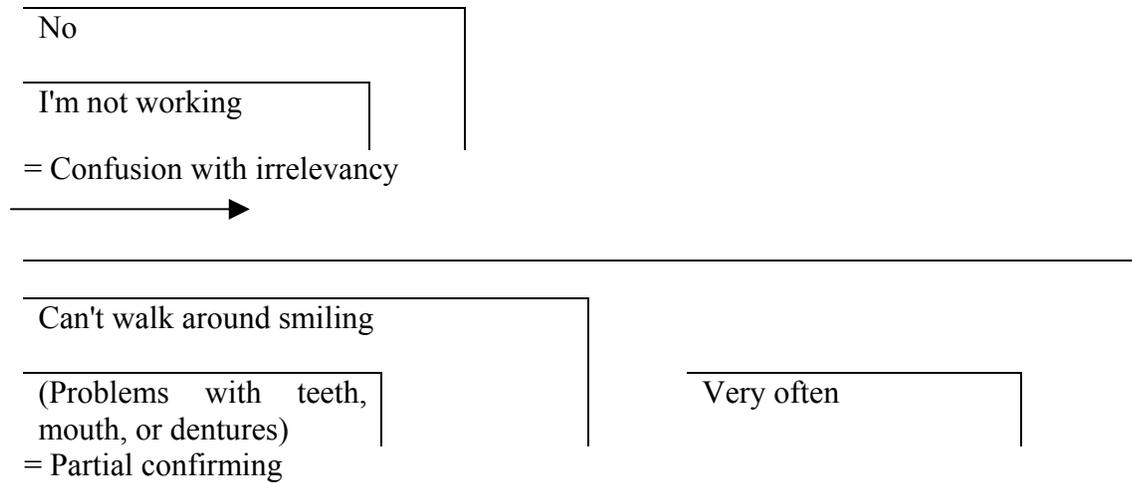
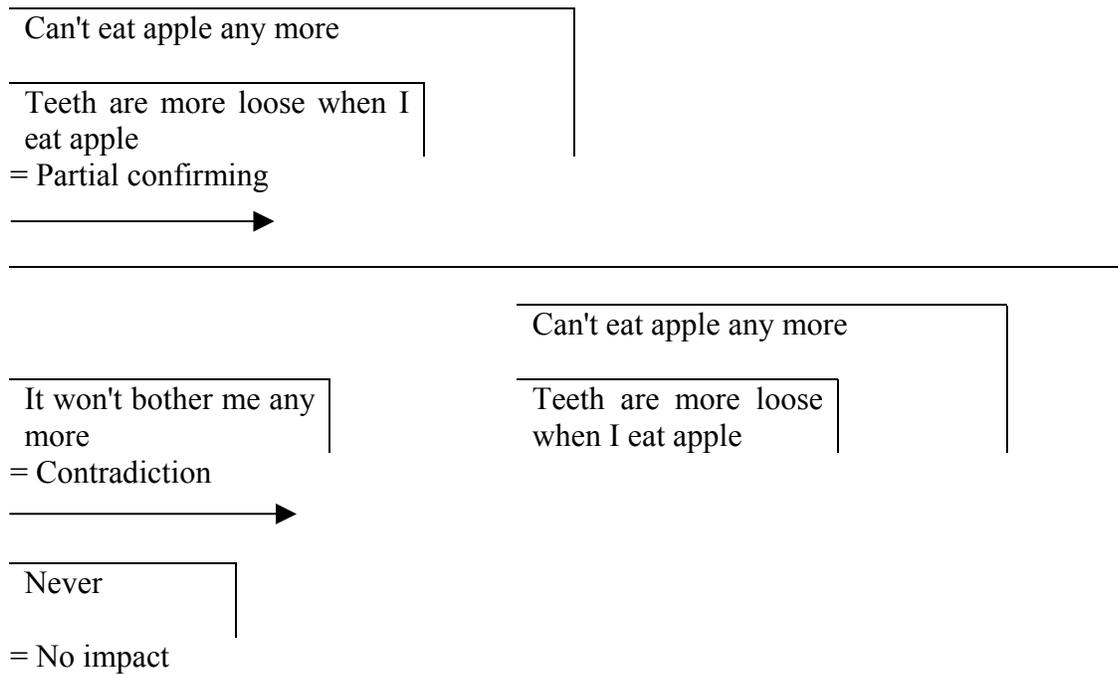
**Figure 4. A summary of the emergence of partial confirming in incident 3****Figure 5. A Summary of the emergence of confirming through normalisation****Figure 6. The emergence of confirming after confusion in Incident 8**

**Figure 7. The emergence of confusion in incident 18**

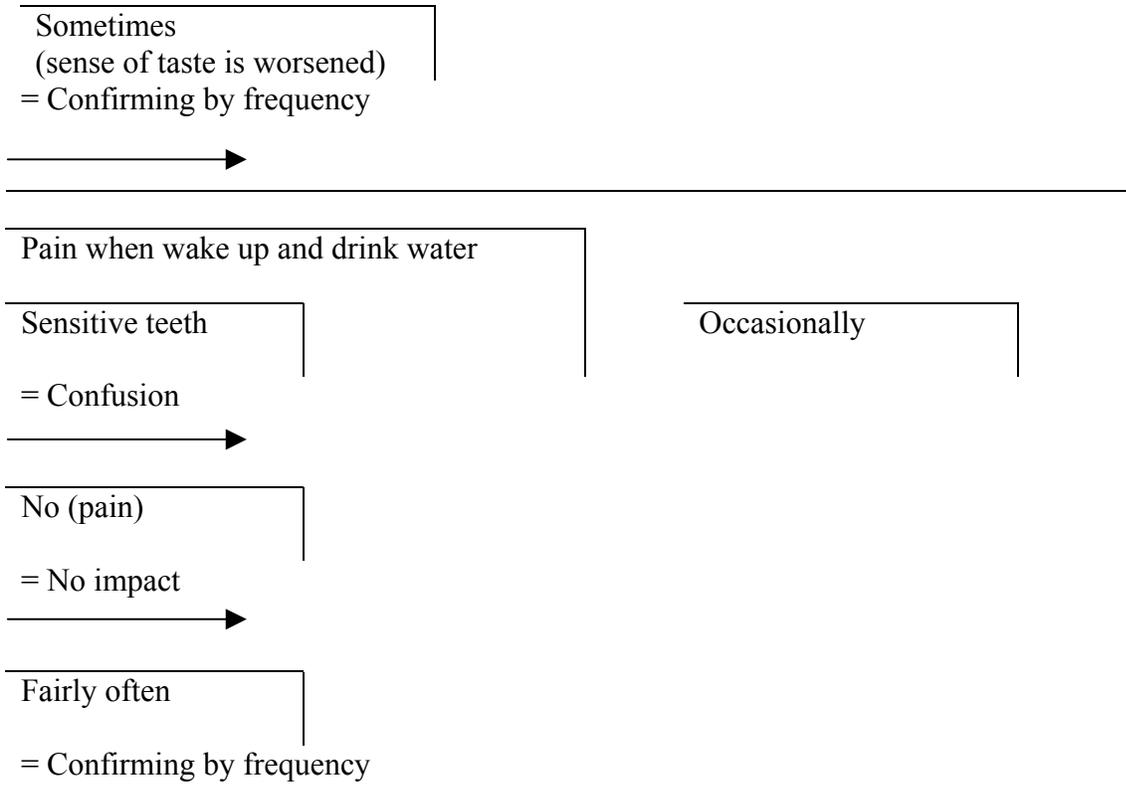


**Figure 8. A summary of the emergence of confusion in incident 22**



**Figure 9. A summary of the emergence of confusion in incident 23****Figure 10. A summary of the emergence of contradiction in incident 26**

**Figure 11. The emergence and resolution of a contradiction in incident 29**



**Table 1**  
**A quantitative summary of the outcomes of discussions about the meaning of OHIP-14 questions**

Category	Number	Percentage
Confirming	63	78.7
Complete confirming	28	35
Partial confirming	25	31.2
- through impact and cause without frequency	5	6
- through impact	17	21.2
- through cause	3	3.7
Confirming through normalisation	2	2.5
Confirming after confusion	8	10
- in the meaning of the impact	5	6.2
- in the meaning of frequency	1	1.2
- in general and specific meaning	2	2.5
Confusion	10	12.5
Confusion of cause	3	3.7
Confusion of impact	3	3.7
Confusion with irrelevancy	4	5
Contradiction	7	8.7
in the same question	3	3.7
in different question	3	3.7
in both the same question and different question	1	1.2
Total	80	100

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# (THE SYSTEM OF) SEVEN BASIC GROUPS OF SYSTEMS THINKING PRINCIPLES AND EIGHT BASIC ASSUMPTIONS OF A GENERAL THEORY OF SYSTEMS

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Stefan Kajzer,<sup>4</sup> and Stuart Umpleby<sup>5</sup>

## THE SELECTED PROBLEM AND VIEWPOINT OF DEALING WITH IT

In 2003, one could celebrate seventy-five years since the first articles by L. von Bertalanffy (LvB), sixty years since the first articles that are known as the beginning of the science of cybernetics, fifty years since the establishment of the Society for the General Systems, thirty-five years since the first publication of the seminal book about the General Systems Theory by LvB (that is still being republished, e.g., in 2001), twenty years since M. Davidson's book about LvB (that is also still being republished in different languages), and ten years since the first IDIMT Conference. The selected problem of this contribution is not the anniversaries, but an issue showing up along with them: *do we all mean the same when we speak about systems theory and cybernetics, and do we mean the same attributes when we use the language of systems theory?* The conferences and journal let us see that no, we do not. Hence, the selected viewpoint is an attempt to offer a common denominator for discussion that may lead to more mutual understanding, and thus to better cooperation (including being understood by others, who are not members of the systems science community, formally, but may better use systems principles in their own work).

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This contribution is based on the long-term basic research program "Innovative Enterprise in Transition", sponsored by the Ministry of Education, Science, and Sports, Republic of Slovenia, 1999-2003.

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## SYSTEMS THEORY VERSUS SYSTEMS THINKING IN PRACTICE

### Similarities versus interdependencies

LvB gave his impetus to the creation and application of systems theory as a person of many interests and fields in which he contributed seminal achievements to the science (see LvB Conference 2001). He did so when his capacities allowed him to perceive that the unavoidable and exaggerated narrow specialization was too reductionist and hence caused humankind to make a crucial oversight—the oversight of the *whole*, when dealing with parts of planet Earth and issues of human life and other natural processes (Davidson 1983). LvB warned that humans must see the entire biosphere and behave as citizens of the entire world, not of single countries only, for humankind to survive. The two World Wars and the world wide economic crisis between them (in 1914-1945) happened in his lifetime, so he knew what he was talking about.

But there were not many who embraced his warning fully. We do not mean that we people are bad, we are just not Gods, but humans and hence capable, as individuals, of mastering only a small part of the entirety of humankind's knowledge. And as specialists, who in their education are offered very little opportunity to think and work on an interdisciplinary basis, most humans are hardly able to reach beyond the unavoidable limits of our rather narrow area of expertise and life experience. We can see this limitation even inside the systems science community: most conferences are made up of symposia dedicated to specialized areas of expertise rather than linking mutually different specialists around some shared topics, even less so beyond them. And the few conferences that are trying to give life to more interdisciplinarity have small attendance and receive rather few notices in the professional press, not to speak of the general press that serves as the major opinion maker for most humans. Rather than blame or distress, this is rather an impetus for us, who try to carry on the LvB's seminal work (see Bertalanffy 1968), and our fellow humans to do something to enable our planet Earth to survive. (see Ecimovic et al. 2002)

The lesson from which we can start reaches back in history, and reveals that most readers of LvB seem to have made a serious oversight when learning from him about his General Systems Theory. As Davidson (e.g., 1983) finds, many readers of LvB see him as the author of the theory of similarities called isomorphisms. They certainly express and expose an important attribute: isomorphisms enable the transfer of attributes from one specialized field of science into another specialized field of science, such as from biology to electronic or other engineering and from there to medicine, in order to produce means that help people survive or cure diseases, overcome disabilities, etc. But such readers, frequently, fail to see or to find important, at least, the fact that a fruitful, innovative, transfer of knowledge takes place in interdisciplinary teams made of people sharing ethics of interdependence.

LvB exposed interdependence much more than most of his readers have found crucial, or at least as much as we were able to detect. Namely, LvB required humans to see the entire biosphere as one organization full of mutually supporting and mutually fighting interdependences. With narrow specialists, as we all unavoidably are, interdependence is crucial to complement our specializations. Over the last few years, even politicians experience and express this fact, and journalists keep quoting these parts of their speeches quite a lot. The

reason behind the scene is clear: without interdisciplinary creative cooperation of mutually different and equally influential and regarded specialists there is hardly a chance for the requisite holism to be attained; as soon as one works on complex problems (and very few problems—as open and important issues the solutions of which are not known—do not qualify as complex ones, at least not in the modern life).

Holism has never been attainable, if the word is taken completely literally as it is defined in dictionaries: it includes every attribute, all attributes, and nothing (!) is left aside. All (!) professions (which tend to be one hundred thousand, according to data from international fairs on education issues) would have to be included. And this cannot be done. That's why Mulej and Kajzer introduced the "law of requisite holism" (Mulej and Kajzer 1998; Rebernik and Mulej 2000; Potocan, Mulej, and Kajzer 2002; Mulej et al. 2000; Mulej 2000; Mulej and Zenko 2002). It expresses the experience that one has the unavoidable habit to select the (dialectical) system of viewpoints to be considered, and to leave the others aside, or to reduce even more.

After too many terrible consequence of too narrow/reductionist selections of the decisive persons' (dialectical) system/s of viewpoints surfaced in the form of the World Wars and the worldwide economic crisis between them (1914-1945), the LvB's General Systems Theory appeared and received quite a good acceptance. As we saw, it was soon reduced from the worldview and science of holism attained by interdisciplinarity to a science of similarities, allowing specialists to remain inside the ivory towers of their own and separate disciplines. And this did not happen for the first time in history.

As far back in history as the ancient China of four thousand years ago, one can find the principle of yin and yang as a basically systemic concept. Later on, but still in the times of ancient Greece, one can find dialectics, basically a systemic concept, also. We can find dialectics renewed in the nineteenth century. This does not mean, that the systems theory is more than about fifty years old, but it does mean that systems thinking, as a holistic approach, is an ancient human experience. Indeed, yin and yang, as well as dialectics, denote interdependence (Delgado and Banathy 1993).

Every science makes its impact by its language, too. What happens in this respect in the case of systems theory? We will take two looks at it: (1) as the theory backing systems thinking as a way of thinking, (2) as a theory of systems describing complex features.

## **THE BASIC SYSTEMS THEORY VOCABULARY**

### **Survival of a lack of (the requisite) holism under the name of systems theory is possible**

Soon after the establishment of General Systems Theory, there were other forms of systems theory emerging and establishing themselves. Jackson (1991) lets us know that there have been two big waves in the systems theory formation process. He groups the ones from the 1940s to the early 1970s as traditional, the newer ones as modern. The difference is basically two-fold:

- 1) Practitioners of the traditional mode aim at *generality* in their theoretical findings and keep to a *functional, hard-systemic*, very reliable dependence on a process outcome/output

on the process input, which they are used to seeing prevail in the (natural) sciences.

2) The modern ones aim at solving rather *specific* issues on the basis of the principles of systems thinking, at further elaboration and development of those principles, and they keep to *either a hard-systemic or a soft-systemic theory*, covering probabilistic rather than reliable dependence of the process outcome on the process input.

The switch does not mean that there is anything wrong with findings of the traditional systems theory, except the *exaggerated generalization, positivism* (= limitation to plain facts with no explanation, comment, individual interpretation, conclusions) and *functionalism* (= tendency to discover only the visible utility of findings and found attributes). In other words, the traditional systems theory/ies is/are not so very generally valid as it/they were supposed. It/they came to be too theoretical/self-sufficient to adequately reflect reality. Still, as a (then new) science/s it/they did introduce a number of *basic notions*, which have an equal general meaning in all the traditional and modern systems theories and include (alphabetically):

- 1) Attribute (= characteristic of the system or environment or element of relation under consideration).
- 2) Border (= delimitation between the system and its environment).
- 3) Closed system (= system with no exchange of energy, matter, and/or information with its environment).
- 4) Communication (= contacts, which transfer data, messages, information).
- 5) Control (= manage, master, achieve a target-oriented behavior of a system or by it).
- 6) Data (= signs ordered according to a syntax rule in order to potentially mean something to somebody; the syntactical level of making a potential information is its very first step).
- 7) Element (= component, part of an entity).
- 8) Emergence (= making of new attributes).
- 9) Feedback (= response by output to the source of input).
- 10) Hierarchy (= building more complex structures and entities/wholes from simpler ones).
- 11) Homeostasis (= keeping the given attributes unchanged, although there are inputs over the system).
- 12) Identity (= keeping the same basic attributes unchanged, although not all attributes).
- 13) Information (= message, which influences somebody; any influence causing a change with its receiver).
- 14) Input (= influence from environment over the system).
- 15) Message (= data, to which somebody perceives and ascribes a meaning, the semantic level of making a potential information).
- 16) Model (= mental or physical representation of a system; there are describing and prescribing models).
- 17) Negative feedback (= response, which diminishes the change and stabilizes the given status).
- 18) Output (= influence from the system over its environment).
- 19) Open system (= system with exchange of energy, matter, and/or information with its environment).
- 20) Partially open/closed system (= system with a limited exchange of energy, matter, and/or information with its environment).

- 21) Positive feedback (= response, which enlarges the change and destabilizes the given status).
- 22) Purpose (= functional reason of existence of a system).
- 23) Relation (= root of impact between elements).
- 24) Synergy (= new attributes caused by relations/interaction, and nonexistent with individual elements alone).
- 25) System (= whole, entity<sup>6</sup>).
- 26) Systems typology (= types of systems in terms of the selected attributes under special attention/investigation, such as the above quoted close, open, partially open/closed system; dynamic and static systems; functional and natural ones, etc.).
- 27) Transformation (= changing the attributes of the system due to inputs).  
(see Jackson 1991, and journals dealing with systems theory).

In those times the difference between systems theory and cybernetics was also defined:

- 1) The point of *systems theory* is to describe entities as systems, especially on a transdisciplinary level (= applicable to any discipline of science, and belonging to none of them exclusively).
- 2) The point of *cybernetics* is to control systems as complex, probabilistic/heuristic, dynamic entities by (feed-forward) information and feedback (information). In first-order cybernetics the observer of the system was considered to be acting from outside the system. In second-order cybernetics the observer of the system came to be considered as an active component of the system, which means involvement and hence less objectivity of consideration. In third-order cybernetics the observer of the system is considered as an active component of the system that observes, decides and acts (see Umpleby and Vallee in Mulej et al. 2000).

Earlier, we briefly mentioned the issue of the selected viewpoint, and earlier the issue of the unavoidable specialization, along with which holism is also unavoidable for those who do not want to be in danger of making too serious oversights. Why are we now coming back to them?

If the point of systems theory is to *describe* entities as systems/wholes, this is easy to accept and understand as long as we stay within the very simplified picture of reality that the abstraction in theoretical mathematics offers us and makes us forget about the real life complexity (for good reasons that we do not oppose here, but we wish rather to concentrate on the other part of the story). So what?

1) We know, that system is defined as an ordered set, i.e. an entity made of a set of elements/components/parts and a set of their relations/interdependencies, on mathematical formal terms.

2) We also know the real-life experience, that there are too many real attributes with almost every entity for a person to grasp, perceive, understand, and master all of them, especially in real time.

3) This fact causes unavoidable specialization which has helped—by reduction of the really given amount of attributes of the entity under consideration to an amount, which one selects

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<sup>6</sup> Although we could quote LvB saying (rightly) that a system is a mental picture of an object, many authors put the object under consideration and the system equal. This means that they do not see that there are many viewpoints around and that each and every one selects another system to represent the same object.

into the role of the essential ones while leaving others aside. The selection depends on the selected viewpoints (and is found so natural that very few authors of systems theory discuss it, thus letting their audience oversee the crucial consequences of this selection).

4) In this way, one creates a mental entity, which is not equal to the real entity, in terms of its contents, but still may be called a whole/entity/system in terms of the mathematically formal definition. From now on, the mental entity replaces the real entity as information used in the further process of investigation, thinking, decision-making, and acting.<sup>7</sup>

5) The practical consequences include the fact that one works on a reduced basis, while one thinks that one works on a holistic basis. Reductionism is especially important in the case of GST. We did to some extent demonstrate, what LvB had in mind and what has later on happened instead of his wonderful intentions.

6) It is namely the generality of bases of consideration and scopes of consideration that LvB had in mind (if we may remind you). And it is our understanding that LvB implied that interdisciplinarity is unavoidable, because he explicitly attacked overspecialization and warned against oversight of interdependences<sup>8</sup>. Explicitly, of course, he spoke of isomorphisms rather than interdisciplinarity.<sup>9</sup>

7) This means survival of reductionism under the name of GST as a science and worldview, which came into being to fight reductionism and to promote holism.

Thus, we may not be satisfied with the GST as practiced today, once we are investigating ways to help humankind solve the problems of today!

The GST as of today does not provide for holism, which it has been promising and established for!

Now, once we make such a strong conclusion, what is actually holism? We found no publications about it, hence it is deemed self-explanatory like the issue of viewpoint and its selection is, one may conclude. Let us deal with it a bit (which brings us to the theory of systems thinking)!

## **THE SEVEN BASIC GROUPS OF TERMS OF SYSTEMS THINKING**

### **A suggestion**

The few basic terms belonging to the concept of systems thinking, may in a summary include the left column, and fight the right column, in fig. 1 (see Mulej et al. 2000):

<sup>7</sup> In German, perception is expressed as "Wahrnehmung", which means: by perception we take the observed object as real, and we do so inside our selected (dialectical system of) viewpoints, of course (see e.g., Tomsic 1959).

<sup>8</sup> Interestingly enough, interdependence is not included in the above list of basic terms explicitly, but it is so implicitly by the terms relation and feedback.

<sup>9</sup> If you take ISSS45 (2001) as a fresh case of an old tradition of dealing with the GST on a systems-scientific basis, you can easily see that there are many very interesting contributions, but hardly any interdisciplinarity. The authors' endeavors at holism are limited inside their own viewpoints and professions, there are very few coauthored papers and even fewer papers co-written by authors of different specializations.

**Fig. 1. The Basic Seven Groups of Terms of Systems/Systemic/Holistic versus Non-systemic Thinking**

<b>Systems/Systemic/Holistic Thinking</b>	<b>Unsystemic, Traditional Thinking</b>
Interdependence/s, Relation/s, Openness, Interconnectedness	Independence, Dependence, Closeness
Complexity (plus complicatedness)	Simplicity, or Complicatedness
Attractor/s	No influential force/s, but isolation
Emergence	No process of making new attributes
Synergy, System, Synthesis	No new attributes resulting from relations between elements
Whole, holism, big picture	Parts and partial attributes only
Networking, Interaction, Interplay	No mutual influences

**Short comments to each line in fig. 1**

*Interdependence/s, relation/s, openness, interconnectedness*

These are attributes, which the entire biosphere including all of humankind has always had very many of, in reality. Humans have not perceived all of them, as accidents, epidemic diseases, wars, etc. tell us. Over the last centuries humans have developed science to find out as much as possible about the biosphere including themselves. In order to find out details of the given facts and in order to be able to use them properly, the specialization had, unavoidably, to make very big steps towards concentration on selected small parts of reality and its real attributes under the name of specific profession/s. The contemporary proverb reflecting this history reads: "What I know is a drop, what I do not know is an ocean". It is good and crucial to know details, but it is bad to forget that parts of reality, details, do not exist alone. At a session of the Assembly of United Nations in Fall 2000, the then president of United States found it necessary to say explicitly: "We must not forget that we are interdependent". Two centuries earlier, United States passed a Declaration of Independence. Both are needed, but observe and manage reality from different viewpoints.

*Complexity*

This is an attribute of reality (and, hopefully, of human's mental picture of reality, too), which expresses one type of entanglement. It is the type, which results from relations, especially interdependencies. What complexity denotes are the attributes resulting/emerging from relations, interdependencies, which means that these attributes always do exist, but do not always enter the mental picture, if the observer of reality concentrates on parts of this reality and observes them in isolation from the other parts. Complicatedness, on the other hand, denotes the other type of entanglement, which covers attributes of the parts alone, seen as entities with no observation of their relation/s with other entities. Simplicity (of picturing/modeling the reality and of thinking, basis of decision making and action, not of products) comes into existence, when there is no entanglement, or when one is unable and

unwilling to observe reality with all/many attributes of its parts and their relations.<sup>10</sup>

### *Attractors*

This is an expression, which we can more easily find in the Chaos and Complexity Theories than in the traditional and some other systems theory/ies. It is another expression for relations and their impact. It attacks the opinion that nature lives in isolated parts, and finds this opinion to be a crucial oversight. Especially interesting has been the notion of strange attractors, which basically denotes the surprise of narrow specialists when unexpected attributes showed up, which they did not foresee due to their specialization and lack of a broader interdisciplinary co-operation.

### *Emergence*

This is again an expression, which we can more easily find in the Chaos and Complexity theories than in the traditional systems theory/ies. It speaks of the process resulting from interaction of interdependent parts, when they stop being independent and start to make an impact over each other. Attractors cause emergence of new attributes, which are not typical of individual parts as independent rather than interacting entities. Inside an investigation, which is limited to the entanglement called complicatedness, there is no emergence to be found, because relations are not the topic of investigation. Emergence does happen all the time anyway. We can discover it, if concentrating on complexity, interdependencies, relations, attractors, rather than on isolation.

### *Synergy, system, synthesis*

These expressions denote in two ways the same reality: an entity is made of an ordered set, which is made of two sets, on mathematical formal terms. These are (1) the set of parts, which are considered components of the entity, and (2) the set of their mutual relations without which the entity could not be different from each and every part alone. Thus, synergy/system/synthesis results from the process of emergence of new attributes, which are caused by mutual attraction/impacting/influencing/relations/interdependencies of the parts, and which are not caused by the parts themselves and isolated from each other.

### *Whole, holism, big picture*

These terms are the central notions of systems thinking. The above discussion explains this: systems theory came into existence and received public support in times when it was very clear that the terrible destruction of the two World Wars and of the Big Economic Crisis in the period 1914-1945 had been caused by the lack of holistic/systemic thinking, which in its turn had been an unfortunate and unforeseen side-effect of unavoidably growing narrow specialization. Narrow-minded individuals (such as Hitler, Mussolini, etc.) were entitled to make decisions with very broad consequences, including many tens of millions of dead. As we

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<sup>10</sup> There is a proverb reading: "When you feel capable of mastering a situation, and when you feel incapable of it, you are right". The same applies to admitting or not admitting real complexity, complicatedness, or simplicity. It is your attitude, which becomes your subjective starting point of your action, its process, and its result/s, in both cases.

did see in some more detail earlier, LvB, the father of the General Systems Theory, wanted to prevent the bad consequences of the over-specialization and wanted therefore to provide for

holism as a new world view  
rather than a specialized science  
of its own narrow scope, e.g. in similarities, only.

A science about systems thinking should, like every other science, support its attainment and employment. But, as demonstrated above, the notion whole, on LvB's terms, has come to demand too much in terms of capacities and felt needs of most individuals as specialized persons and professionals. In addition, systems theory and cybernetics of those times did not try to produce interdisciplinarity and interdisciplinary creative co-operation, but rather tried to produce isomorphisms. Isomorphisms (= similarities) did allow for transfer of findings and ideas from one specialty to another, but allowed mutually different specialists to go on working in isolation rather than in cooperation.

*Networking, interaction, interplay*

These notions express practical roads from one-sided/biased/locked in/tunnel vision specialization to requisite holism, if we speak of humans and human action. Of course, all three emphasized notions that express the same process also from the biological, natural viewpoints with no human intervention: trees, bushes, other plants, animals of different kinds are networking/interacting/interplaying to make a wood, a river, an ocean, etc.; similarly do cells etc. in a living body, planets in the universe, etc.

It is, hence, if we take a case of mutual relations between humans, democracy which makes room for (requisitely) creative and holistic thinking, decision making, and action (if it is not a formality, in which it is only defined, who are the individuals/groups in power and hence entitled to meet their own narrow interests rather than to serve as managers of networking, which targets holism). Democracy, then, must be a normal social relation everywhere, not only in politics. Most commanding characters/persons and narrow specialists have never had much education/feeling/appreciation for systems thinking.<sup>11</sup> Very few around the globe had and/or have courses in systems theory.

But very few versions of General Systems Theory/other systems theories cover the seven groups of attributes of systems thinking with the conclusions presented above. Many of them prefer to work in terms of a theory of systems.

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<sup>11</sup> If they had enough education to practice systems thinking, they would most probably be democratic, e.g. able to listen to and hear and accept views of their opponents as complementary rather than dangerous.

## THE EIGHT BASIC TERMS OF THE THEORY OF SYSTEMS

### A suggestion

The basic assumptions underlying systems science as the science/theory of systems<sup>12</sup> were summarised by Dent and Umpleby (1998). Their summary shows very well how different the perception of notions may be, even when different authors talk about what is deemed to be the same topic in the same language. They define the following key assumptions.

#### *Self-organization*

Self-organization refers to the idea that the elements of a system move toward their current states through their mutual interaction versus the assumption that one or a small number of causes primarily affect the elements of a system. Systems scientists claim that all systems are self-organizing, but some authors emphasize this phenomenon more than others.

#### *Observation*

A key belief underlying classical science is that observations are independent of the observer. In recent years, due in part to studies of the nervous system, more attention has been paid to subjectivity and to including the observer within the domain of description. According to this point of view, observers have immediate access only to their experience, and each observer constructs a "reality". Hence, constructivists emphasize perception, conversation, and reality construction<sup>13</sup> while realists assume that descriptions can be accurate representations of an external world.

#### *Reflexivity*

Reflexive systems are composed of knowing subjects with characteristics such as the following: they are able to generate new states in themselves (think new thoughts, do new things) that they never manifested before; they are people (or machines) best thought of as continually trying to generate such new states; and they have the property of being able to notice external attempts to theorize about them and model them. They modify themselves according to their reaction to this information. The alternative view is that observing does not influence the objects of study.

#### *Indeterminism*

The assumption of indeterminism is that at times it is inherently impossible to determine in advance which direction change will take. The alternative view is that conclusions can be precisely drawn from a set of known variables.

#### *Environment*

Several systems traditions assume the environment plays a role in the manifestation of

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<sup>12</sup> Systems are considered complex entities such as machines, human beings, or organizations. There is no word for a system as a mental picture of such an entity from a selected viewpoint in the general theory of systems (see Dent and Umpleby 1998: 513).

<sup>13</sup> In this way, the role of the selected viewpoint is acknowledged (see Dent and Umpleby 1998: 514).

the phenomenon (environment-full). The environment is central to understanding and explanation. The alternative view is that environment does not matter (environment-free).

### *Causality*

Assumptions about cause and effect, as well as those pertaining to observation and level of explanation (holism or reductionism), give the best indicators of worldview. A concern with circular causality as opposed to linear causality was a key issue leading to the establishment of several systems science traditions.

### *Holism*

People who claim to take a systems approach probably have most in common taking a holistic view rather than a reductionist view. Many writers in the last twenty years have discussed how reductionism has been taken too far. Nonetheless, reductionism is deeply ingrained in Western culture. Here holism means the assumption that an entity can be best understood by considering it in its entirety. The entity has characteristics that belong to the system as a whole and not to any of its parts. Conversely, reductionism is the assumption that an entity can be divided into its component parts and the cumulative explanation of the parts and their relations fully explains the entity.<sup>14</sup>

### *Relationships*

Another underlying assumption shared by many systems traditions is that the unit of analysis should be relationships rather than entities. Entities only take on meaning when they are in interaction with each other. The alternative view is that the unit of analysis is the entity—the world is comprised of distinct entities which themselves are fruitful objects of study. It is especially useful to understand the basic building blocks of phenomena.

## **SOME CONCLUSIONS**

### **Systems theory may block or support systems thinking**

1) It is possible to use a system theory either as a tool of systems/holistic thinking, or as a formality, which allows its user to employ terms/vocabulary from systems theory—as fictitious words and bluffing expressions—and to remain mostly one-sided, limited to one single profession and/or specialization, anyway. This is evident in most papers in conferences on systems theory/science such as ISSS45 and EMCSR (see ISSS45 2001 and Trapp1 2002); these are not interdisciplinary, which STIQE, IDIMT, "Problems of...", and few others are (see Rebernik and Mulej 1992-2002; Chroust 1993-2002; and Zeeuw et al. 1991-2001), but not many more). Oversight of these attributes belongs on the list of causes of the climate change, too.

2) It is also possible to employ systems thinking with no employment of a formal systems theory. There are many systems theories, and very few of them allow for, or even

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<sup>14</sup> There is no word about the selected viewpoint and the dialectical system of viewpoints as a precondition for holism to be less fictitious (see Dent and Umpleby 1998: 514).

actively support, interdisciplinary creative co-operation as a way towards a relatively high level of the requisite holism. There are, on the other hand, also practices and methods such as Total Quality Management, Project Management, Business Reengineering, Work Simplification, etc., which can allow for systems thinking with no formal application of systems theory's language.<sup>15</sup>

3) Any analysis of the backgrounds of success and the backgrounds of failures, for instance in business (see e.g., Collins and Porras 1994), can demonstrate that success is backed by much more (informal) systems thinking than is failure. The need for sustainable development and the acknowledgement by the broadest political body of humankind, the UNO (in 1992 in Rio de Janeiro), that the general environmental problem exists as a pressing problem clearly demonstrate that.

Failures are backed by  
a lack of systems thinking,  
and that is so on a large scale,

even half a century after systems *theory* has come to be established and recognized around the world.

The above conclusions let us see the difference between systems thinking and systems theory (from the viewpoints selected here):

1) Systems thinking is the practice of those who are holistic enough in their thinking, decision making, and action to cover all essential attributes because they are broad and interdisciplinary enough. They therefore attain more successes than failures.

2) Systems theory is, like every theory, an abstracting generalization of the practical attributes of systems thinking, or of description of complex entities called systems.

3) In contemporary practice, there is no one single systems theory, because many authors/groups of authors have adopted a number of different viewpoints to investigate/manage their selected parts of the entire Nature/Earth/life reality. The issue of viewpoints and their selection has been neglected, which has led to oversight of its crucial importance.

4) The negligence/oversight of the issue of the selected viewpoint/s and its/their crucial impact on the selection of attributes to be classified as essential on the one hand and as unimportant on the other hand, has led to another oversight: the importance of definition and agreement on what the concept holism mean in terms of contents of investigation/thinking/decision making/action. The consequence reads: one can have systems theory, in terms of mathematical formality, and still have no systems/systemic/holistic thinking, in terms of contents. (In Webster's Dictionary [1987] one can find 15 groups of definitions what a system means in terms of its contents; on the other hand, in another dictionary one can find only three [Hornby et al. 1963], and in another [Webster 1978] only

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<sup>15</sup> However, the said methodologies do not support systems thinking automatically. If a formal insight into processes matters more than interdisciplinary co-operation, parts matter more than interdependencies, linear thinking matters more than consideration of complexities, routinization of the old habits matters more than synergy and innovation, etc., then the said methodologies do not support systems thinking as a holistic one.

two).

5) The millenia old Chinese principle of interdependence *Yin-Yang*, ancient Greek philosophy of *dialectics* (= interdependence), and versions of dialectics in philosophy of the 19th century (idealistic dialectics by Hegel, materialistic dialectics by Engels and Marx), etc., reflect the real-life practice that some kind of systemic/holistic/systems thinking has been around forever. At the same time, their formulation as version/s of philosophical teaching as science about thinking and the general essence says that systemic thinking has always been a rather rare experience compared to the style of thinking, which is represented in the right column in the fig. 1.

6) Most theories come later than the practice, which they describe/generalize, rather than prescribe. And they make the practice seem simpler than it is, because theories (by definition of their role) tend to concentrate on the general, most frequent, part of attributes, and leave the group-specific and individual specialties aside. (See fig. 2.)

7) Assumptions about attributes of systems as existing entities allow for description from a number of quite different selected viewpoints that should better be explicitly stated for the audience to understand the authors and be able to creatively cooperate with them.

**Fig. 2. The Three-part System of Interdependent Attributes of Every Object under Consideration**

<b>The three-part structure of attributes of any object of consideration (by Dialectics Theory)</b>	<b>The practical consequences of the three-part structure (in the real life)</b>
<i>The general part</i> , equal for all components and relations of the object under consideration	<i>The general isomorphisms</i> , equality, attributes shared by all members of the object under consideration
<i>The group-specific part</i> , equal to groups of components and relations (subsystems) of the object under consideration	<i>The grouping, partly dividing isomorphisms</i> , different from subsystem to subsystem of the object under consideration
<i>The individual part</i> , different for every component and relation of the object under consideration	<i>No isomorphisms</i> , only differences between component and relations of the object under consideration

A formal application of a theory has:

the good consequence that the most expectable part of attributes may be discovered and dealt with more easily, and

the bad consequence that the many less general attributes may receive an exaggerating oversight rather than a requisite attention.

This may happen in the case of systems theory, too. And this is why we prefer systems thinking to systems theory, but we also prefer systems thinking based on systems theory to the one with no such background and based fully/too much on an uninvestigated experience/intuition.

Specialists or practitioners tend to mostly or even exclusively consider the individual part in fig. 2; managers are supposed to concentrate more on the group-specific part; theorists mostly on the general part. In reality, all three cannot be separated, they all exist at the same time, and all should be covered, on the basis of application of systems theory/thinking.

In terms, for instance, of sustainable development, LA21, and climate change, these findings may lead to a conclusion, that

systems thinking based on a realistic systems theory  
may be able to help humankind find a new way toward survival

more probably than the fictitious, one-sided, solutions of pollution etc. can (see Ecimovic et al 2002).

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## REVIEWS

***Global Citizenship and Social Movements* by Janet J. McIntyre-Mills. Australia: Harwood, 2000. ISBN: 90-5702-590-6**

In *Global Citizenship and Social Movements*, McIntyre-Mills's aim is to impress upon the reader the importance of adopting "inclusive thinking, which traces common webs of meaning across the separate frameworks of cultures and social values" (p. 1). She suggests that because we share a common humanity and a common environment, we should join the enterprise of creating our futures together.

She starts off by suggesting that the "fallout caused by rapacious forms of capitalism as well as socialism" cannot be addressed unless people develop creative thinking that transcends technocratic modes of thinking about "problems". To help people to respond more creatively to the challenges of the new millennium, she proposes to offer a variety of "thinking tools" to create what she calls "shared webs of meaning" (p. 20).

Having explained the importance of developing intellectual courage (which she links to the development also of intellectual dexterity) in *Chapter 2*, she goes on in *Chapter 3* to offer the tools for dexterous as well as ethical thinking. She offers some detail on De Bono's "water logic" as a way of avoiding simplistic thinking in terms of binary oppositions ("either/or" thinking). She also explains Flood and Romm's ("both/and" thinking) linked to their concept of triple loop learning. She points to the importance of developing a critical systemic approach to manage the diversity of ways of thinking about problems/issues of concern. And she elucidates how people can develop their power to act within specific "social, political and economic contexts" (p. 55). She supports her suggestions by linking together arguments from a range of authors who have offered proposals for generating "a holistic grasp of the links amongst variables" (p. 58). She refers in particular to McLuhan and Powers, whose work in holistic thinking is also explained in this chapter. McIntyre-Mills furthermore suggests that mental "walk-throughs" using scenarios can help us to consider implications of specific assumptions for definitions of social problems and resultant policies and practices ensuing from the starting assumptions. Throughout the chapter she gives examples to illustrate her optimistic (but not naïve) conception of possibilities that can be created via the range of thinking tools that she explores here.

In *Chapter 4* she places her argument within a framework that she calls EcoHumanism (p. 72). EcoHumanism (EH) is an approach that is committed to, and tries to foster, "a universal human spirit [that] guides the creation of theory and practice in harmony with people and nature" (p. 73). She notes that EH "does not pretend to be "a new panacea but merely to

assist in developing theoretical and methodological literacy" (p. 73). She explores the intellectual and experiential roots of EH with reference to various sources. She also explains how her own version of "critical humanism" links up with other kinds of humanism and how it developed as a result of "personal experiences as an action researcher in a range of urban and rural contexts and as a university and community teacher" (pp. 77-78).

She devotes *Chapter 5* to exploring the rights and responsibilities of people as global citizens. She explores these in the context of a discussion of capitalism and global markets. She suggests that citizens who accept EH appreciate that it is important to avoid the extremes of individualism and collectivism and that their own empowerment "is rooted in reflection of possibilities as well as action". She gives examples of a number of projects aimed at releasing human beings from what she calls "simplistic, hemmed-in solutions to problems" (p. 111).

She continues in *Chapter 6* to offer a discussion of possibilities for a "sustainable global democracy". Again the discussion is laden with theoretical insights as well as proposals for non-simplistic action. And in *Chapter 7*, she offers an additional example to illustrate the kind of thinking she has in mind as a way of striving for "global democracy". The example is set in South Africa. With reference to a discussion of transformation in the society, she explains how rights and responsibilities may be connected and she explains why dialogue is essential for democracy. From this discussion she moves on to offer a view of our rights and responsibilities as global citizens and she also explains her view of the role that social movements can play in developing networks of meaning beyond nationalism.

She ends the book with a plea for people to co-operate to "build inclusive models premised on a belief in one environment and shared human needs" (p. 153). Her efforts in the book to provide some tools to aid people to develop "creative solutions through wide-ranging social movements" (p. 154) are indeed inspiring. I fully recommend its reading. With McIntyre-Mills, I believe that the orientation outlined and encouraged in her book provides a route to develop humane and sustainable options for our living.

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***Tetrasociology: Response to Challenges* by Leo Semashko.**

*Introduction by Bernard Scott*

Professor Leo Semashko approached me (BS) in April, 2002, and asked if I would help him by doing some editorial work for his book "Tetrasociology: Responses to Challenges". I was sympathetic to his needs as a Russian sociologist wishing to communicate his ideas to a Western, mainly English speaking audience. On a cursory examination, I saw that some of Semashko's colleagues had already done much to improve his original text and essentially what I undertook was to make additional stylistic changes, such as the correct use of the definite article ("the"), the avoidance of abbreviations, such as "isn't", and occasional change of terms,

for example, substituting "the individual", "humanity" or "mankind" for the term "the man". It turned out that I needed to make many hundreds of such changes, working to a publisher's deadline. Because of the limited time, I concentrated most of my effort on the main text (the first fifty pages or so). My feeling was that if the reader makes it that far he or she should be able to make reasonable sense of the remainder (chiefly appended material that includes the thirty two abstracts submitted by Semashko to various research committees and working groups of the International Sociological Association for presentation at the ISA's World Congress, Brisbane, July 7<sup>th</sup> – 13<sup>th</sup>, 2002).

I was acquainted with some of the abstracts in my position as program coordinator for Research Committee 51 on Sociocybernetics. Initially, I was not attracted by the content. My impression was that Semashko's "Tetrasociology" is a grand "theory of everything", closed to alternative formulations. On reading the text of the book, alongside my editing chores, I discovered this was not so, that Semashko is quite clear that he wishes his ideas to be judged alongside others, that he actively seeks collaborations and synergies and that he is prepared to accept that much of what Tetrasociology has to offer, as theory, methodology and application to "real world" problems, is embryonic, and in need of much further development. With this understanding I found myself engaging with the text more sympathetically and with greater interest and came to the conclusion that, at least in broad brush stroke terms, I am very much in accord with the aims of Semashko's research program, finding them very much aligned to those pursued by myself and colleagues within the Sociocybernetics community. On that basis, I accepted Professor Semashko's invitation to make some "editor's introductory comments". I have adapted those comments here to constitute a review.

At around the same time, Semashko sent a copy of his manuscript to Bernd Hornung, who agreed to write a foreword for Semashko's book. With Hornung's permission, I have adapted some of the comments in that foreword to provide the following, complementary review.

As noted earlier, I have only had time to attend to some relatively minor stylistic changes. My reading shows me that the text could be much improved in other ways, chiefly in terms of organization to improve the didactics of how the ideas are communicated. It should also be noted that the text, though relatively short, is a very condensed presentation of ideas that could well be fleshed out to make two or even three book length documents. In this short text, we find a summary of the history of sociological thought, a presentation of the theoretical ideas in Tetrasociology (centered around the concept of the "tetra" (four-fold) structure of "social space-time"), a treatise on "tetra" methodology (a new "social statistics" of indicators applied to a "tetra" classification of "social spheres") and a discussion of how Tetrasociology might be applied to address a number of social problems, grouped under the heading of "the new racism", by which Semashko means the several forms of discrimination and prejudice that (in his view) typify the global, social world of the twenty first century. In order to facilitate the reader's access to the text, I will briefly summarize what I see to be some of the key ideas.

In developing his theory, Semashko characterizes it as a "post-pluralist" sociological theory, to be contrasted with earlier "pluralist" and "monist" positions. The pluralist/monist distinction follows the usage of Sorokin to distinguish between theories that are predicated on

just one primordial aspect or dimension (monist theories) and theories based on two or more aspects or dimensions (pluralist theories). In monist theories, the primordial aspect is typically something like "matter/energy", "spirit", "organization", or "existence". Pluralist theories typically treat two or more of these as "equi-primordial". Semashko asserts that pluralist theories are typical of the postmodern era and that, indeed, we now have a "plurality of pluralist" theories (my phrase) that from the perspective of a "postmodernist", relativistic epistemology may all have some claim to validity. In Semashko's terms, a post-pluralist theory is a "new-old" theory: it is old in that counterparts can be found in the work of earlier theorists; it is new in that it declares that for a sociological theory to be truly "scientific" it must be based firmly on non-relativistic foundations. In other words, an explicitly formulated and agreed metaphysical framework is required, one which, on careful consideration, has to be inescapably "tetra" or fourfold in form.

It is from this point of view that Semashko can declare that (his) Tetrasociology is but one of many possible post-pluralist sociologies, although he would contend that any theory adequate to the job of being a theory of the social world must also be a "tetra" sociology, one that includes four equally primordial aspects, dimensions or coordinates. In his own Tetrasociology, these are termed "resources", "structures", "processes" and "genetics" (historical development). In his review of the history of sociological thought from classical times onwards, Semashko's notes many monist and pluralist theories, including several of the latter which indeed have a fourfold, "tetra" form.

The idea that there is an underlying metaphysical justification for the "tetra" form is not developed until page 20. Didactically, this could perhaps come earlier in the presentation. Curiously, I noted that, although there is a reference to Plato, there is no explicit reference to Aristotle and his "four causes" ("material cause", "necessary cause", "formal cause" and "final cause"). I suggest here to Professor Semashko that this is a reference that many Western scholars would be familiar with, particularly those with a background in Biology, where Aristotle is routinely invoked in discussions of "teleology" and "purposive behavior". Indeed, these very topics are some of those at the cornerstone of the development of the interdisciplinary thinking that gave birth to Cybernetics. Further, it is perhaps here where we can note that the research program of Sociocybernetics is essentially post-pluralist (i.e., scientific) and tetra (i.e., grounded in Aristotelian metaphysics) in orientation. Another useful reference point for many Western readers would be the "process metaphysics" of A.N. Whitehead<sup>1,2</sup>, who updates Aristotle's terminology in his assertion that every "occasion" (one of Semashko's "social phenomena") has the four aspects: "extension", "duration", "idea" and "intention". Other explicitly "tetra" thinkers in recent times are Korzybski<sup>3</sup> (with his General Semantics—an Aristotelian metaphysics that leads to a "non-Aristotelian logic") and Gregory Bateson<sup>4</sup> (e.g., the formula "Information is a difference that makes a difference"), both of whom are acknowledged by Heinz von Foerster<sup>5</sup> as being forerunners of his own distinction between a first and second order cybernetics, where the latter is about "observers in communication", i.e., social phenomena.

Finally, by way of introduction, I wish to alert the reader to the significance of Semashko's idea that the structure of "social space-time" implies the "interpenetration" and "interinclusiveness" of all social phenomena. I see this as capturing the idea of the social world

being a "polycontexture" (Gotthard Gunther<sup>6</sup>) or "multiverse" (Humberto Maturana<sup>7</sup>) (i.e., many-dimensional and faceted) but also in a sense holographic or "organizationally closed", each part—each social phenomenon—having within it an aspect of the whole. Semashko uses the Russian word "matryoshka" for this idea of "interinclusiveness" of wholes and parts.

There are many more ideas and themes that I could address, particularly to draw parallels with other work in Sociocybernetics, not least the emphasis Semashko puts on the importance of the structures and processes that reproduce the social world, the world of social phenomena, which puts one in mind of Luhmann's theory of "autopoietic social systems": self-reproducing, organizationally closed systems of "communications"<sup>8,9</sup>. I could also indicate areas where I am less sympathetic, for example, Semashko's unashamedly utopian visions of a harmonious world and proposals for how to get there, which, as a Christian, I find—as is often the case with scientists who wish to rationally resolve the "problems" of religion—somewhat simplistic. Having said that, I certainly have no quarrel with him for wishing to see more love in the world!

I wish him all success in persuading the Sociology community to engage with his ideas and to help him refine them and apply them in pursuit of his noble aims.

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Leo M. Semashko's *TetraSociology—Responses to Challenges* is in the first place a response from Russia to the challenges of contemporary sociological theory. In the present small book the author gives for the first time an encompassing view of his theories in English, challenging

in his turn the worldwide community of sociologists, and in particular sociological theorists, which is strongly dominated by its "Western", i.e., Western European and North American, members. Therefore the present publication of Leo M. Semashko deserves all the more attention, as it is an attempt at "grand theory" coming from a different part of the world, which in future, hopefully, will take once more an important place in the development of science and culture in our meanwhile global world.

Certainly, among many social scientists "grand theory" has become suspect and out of fashion. And yet, if we limit ourselves to details and "medium range" theories only, we shall never manage to get an adequate picture of the whole, of the intricate networks of modern societies, the global world, and the highly interrelated flows of goods, people, information, culture, etc. In a way, systems theory and sociocybernetics, the latter for the particular field of the social sciences, are inherently aiming at looking at the whole, in particular at the whole complexity, although with a strategy somewhat different from traditional "grand theory" and different also from Semashko's approach. Sociocybernetics insists, e.g., much more on establishing different levels of abstraction. What has been evident both in systems theory and sociocybernetics, however, is precisely a lack of systematic and coherent theory at a meso-level, in between highly abstract "systems" and concrete empirical research, but connecting to both.

This is where TetraSociology fits. Of course, in a way all those pessimists are right who tell us one man alone cannot explain society and that previous attempts have failed. Nonetheless, Semashko is not quite alone, as he draws on the rich wealth of sociological and philosophical thinking, which numerous generations have produced. This is well demonstrated in the present text. Moreover, the present book was written precisely with the intention to break isolation and to submit this result of decades of scientific thinking to the public discourse of worldwide sociology.

In this sense the reader should not expect, like in the great tradition, a complete and finished "system" of sociological theory. Rather it is a provocative attempt, a courageous draft, well developed in some parts, less well developed in others, with missing pieces in still others. The author himself is well aware of this. The scientific discourse hopefully to be initiated by the present book, will certainly help to improve on many of these aspects.

With his TetraSociology Leo M. Semashko presents a tremendous amount of intellectual work with the admirable ambition of providing a synthesis of sociological theory, and not only theory. After all, it is a synthesis of sociological history, including also the technological and empirical levels, although sometimes at the expense of the theoretical rigor of TetraSociology itself.

He tries to give shape to and to systematize a pluralistic, multidimensional scene, aiming at a new kind of social and sociological rationalism. This requires us to formulate and specify appropriate terminological, conceptual, and theoretical tools as a pre-condition to be able to talk about all of this in a systematic and theoretically coherent way. Yet such an endeavor seems to be very difficult. This is possibly also because TetraSociology is a translation from Russian language and from an entirely different scientific and institutional background. The latter, however, should all the more be a challenge to Western social scientists to face TetraSociology and to accept the dialogue.

In the present English translation, TetraSociology certainly needs to sharpen both terminology and concepts, which sometimes should be used more rigorously and more consistently. Avoiding synonyms should contribute to more clarity of the theoretical structure and the apparent re-fusion of concepts that were previously carefully developed and distinguished. This problem may also be at the root of the impression the reader may get that Semashko presents, or rather postulates, a theory of harmony. In certain statements, however, this is clearly relativized by the author, and he shows that he does not see social life as quite so simple. Nevertheless it is an issue that would require more argument and more elaboration.

One of the merits of TetraSociology is to provide a differentiated view of the complexity of social systems along four different dimensions and to specify appropriate categories and concepts. It is not enough, however, to demonstrate a lot of historical examples of fourfold thinking and theorizing, as is done in the first part of the book. Rather more arguments need to be developed in the context of tetrasociological theory itself, why the four dimensions are the solution chosen and why they are necessary for such a sociological approach instead of something else. It seems to remain open, after all, whether the four-dimensionality is indeed an epistemic principle of TetraSociology, e.g., in the Kantian sense, or whether it is just a theoretical principle of this particular kind of sociology. An epistemic foundation beyond the examples quoted would not be too far-fetched, as human thinking is considered intrinsically dichotomous, both by basic Aristotelian logic and by contemporary theories of distinctions. A combination of two dichotomies in a cross-tabulation evidently results in a fourfold structure.

A central weakness in the theory of TetraSociology seems to be the core concept of the "social". On the one hand, there are very clearly the efforts to clarify, to define, and to differentiate, on the other hand, however, there seems to be, at least in the present text, a reductionism of social reality to time and costs but also to a concept called "employment" or "reproductive employment". At first glance this seems to be an economic category, but at a careful reading it turns out to be a catchall category covering virtually every activity. It might even be identified with concepts like self-organization, autopoiesis, or life. Closely related to this and problematic in a quite similar way seems to be the concept of resources.

In the more empirical parts, Semashko stresses justly the necessity of requisite variety in social and political life. Nonetheless, the views expressed about the role of the "old men" seem to be somewhat one-sided or perhaps too strongly shaped by the gerontocratic experience of the former Soviet Union. A correlation of age with skills, experience, and knowledge can hardly be denied, at least not up to the point where senility begins. This raises questions that require further theoretical and empirical research. Are age groups really social actors, or is age just a correlate of other factors? Are these groups, as well as the other "sphere" groups and classes, just classificatory units of otherwise unrelated individuals, do they have functional importance or are they really actors actively steering and controlling society? More research and elaboration is necessary also with regard to the political scheme proposed, which is based on parliamentary (or maybe rather presidential) democracy. These latter topics, however, are clearly far beyond the scope of the short introduction and overview this short book wants to present.

Contrary to many sociologists the author takes serious the famous word of

Wittgenstein: "What we cannot speak about we must pass over in silence."<sup>1</sup> But instead of keeping silence in resignation, he tries to develop an appropriate theoretical language and terminology. In this he may not always have been successful. However, in the attempt to specify a limited number of dimensions, to classify aspects of society and social systems in a systematic way, and to develop an overall framework reaching from the Kantian apriori categories of time and space to empirical indicators, statistics, and even applied technology, Semashko clearly presents material to work on and science in use although not a flawless final solution, whereas many others simply tend to use undefined concepts and terminologies often disregarding and neglecting a wider theoretical and empirical context.

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<sup>1</sup> WITTGENSTEIN, Ludwig: *Tractatus Logico-Philosophicus*, Translated by D.F. Pears & B.F. McGuinness, with the Introduction by Bertrand Russell, Routledge & Kegan Paul, London 1961, paragraph 7.

## NEWSLETTER 16

### 1. LETTER OF THE PRESIDENT

Dear Members of RC51,

I am glad to be able to present to you today the new edition of JoS, which has become an important means of communication among the members of RC51, and beyond. I also have communicated by e-mail with many of you individually as well as with quite a number of other colleagues interested in sociocybernetics. Such individual communication is very important for our Research Committee, especially as I was asked by several of you "... and why don't you offer this and that topic in which I am interested?" Of course, I interpret "you" as "you, the board", because personally I have a much too limited knowledge to offer many topics. Moreover, an organization like RC51 cannot act by itself but only through concrete persons, i.e. usually the board members.

Although our board members do represent a rather wide range of specialties and sub-disciplines of sociology and other social sciences, ranging from human knowing to mathematical sociology and systems theory, from family sociology to world-systems, and from traditional, technically oriented first-order cybernetics to Luhmann and complexity theory, the board is not "the" RC51. RC51 is what you, the members, are, and do, and offer. If you do not articulate your interests in e-mails, Newsletter contributions, journal articles, papers proposed or discussions held, we have no way to know and no way to offer a specific topic, even if the respective topic is a key concern of quite a number of members. Both in conferences and in JoS we, the board members or editors, usually do not invite contributions on specific topics as we did for the Lisbon conference about media, emotions, and the panel discussion on formalization and mathematization of Sociocybernetics. Instead, we usually extend a rather general call for papers or, in case of the World Congresses of Sociology, calls for session topics as we have done just recently for the next World Congress in Durban, South Africa. We then take and work with what our members, you, propose.

This is true also for the Luhmann approach. It does not present the right picture, if some say we are "only" Luhmannian. But also I think it is not correct if others say we have too little of Luhmann. Reviewing our last abstracts booklets, from Brisbane, Corfu, and just recently Lisbon, it seems to me we have found a good equilibrium between the different approaches. Here, also, we can provide a forum only for what our members are willing to present and to contribute.

Hence, if *your* favorite topic has not appeared on the list of activities of RC51 lately,

you are most cordially invited to change this and to propose your topic for one of our next conferences: Maribor, Slovenia 2005, the ISA World Congress of Sociology in Durban, South Africa 2006, and the other, smaller, scientific meetings which are on our agenda until 2006.

Do also *write* to the editors of the Newsletter and of JoS about what is of interest to you (or also what bothers you) or inquire with our webmaster how the RC51 website, e-mail, and the available discussion lists can be better used to promote your interests and concerns.

The tools and forums are there, it is up to us to use them and to fill them with life, with the topics we are interested in personally.

Bernd R. Hornung  
President, ISA RC51

## 2. COMMUNICATIONS ABOUT SOCIOCYBERNETICS

### 2.1 Two Short Reports: 5<sup>TH</sup> International Conference on Sociocybernetics

**"Social Knowledge for the Contemporary World", Lisbon, Portugal, July 26-31, 2004**

*by Cor van Dijkum*

The conference—perfectly organized by a local committee chaired by Mário Vieira de Carvalho from Universidade Nova de Lisboa and supported by Manuel Lisboa from Faculdade de Ciências Sociais e Humanas—attracted about 40 participants that presented their papers and realized a lively discussion. The conference was opened with a speech by RC51 President Bernd Hornung in which he remembered the way Honorary President Felix Geyer built up the group, and asked the attention of the RC51 members for Felix's 70th anniversary. To celebrate this, Vessela Misheva, as Vice-President of RC51 and guest editor, announced a special issue of *Kybernetes* in honor of Felix, to be published in 2005. On behalf of her co-editors Bernard Scott and Cor van Dijkum she handed Felix a nicely decorated document with the names of the contributors. Thereafter the sessions started, most of the time in English, but sometimes in French, and to the enjoyment of the participants also sometimes in beautiful Spanish. An overview of the sessions, the topics and the presenters is at the RC51-website: <http://www.unizar.es/sociocybernetics/congresos/LISBOA/inicio.html>.

The conference lasted 5 days and was accompanied by a number of social events of which were memorable, besides nightly visits to restaurants and café's, the conference dinner in the Mundial Hotel, the Fado Dinner in Bairro Alto, and the Cruise on the Tagus.

As usual the challenging presentations and discussions will have a follow-up in publications, hopefully in the *Journal of Sociocybernetics*, certainly in the special issue of *Kybernetes*, and probably in a number of articles in other journals and books. In this respect Chaime Marcuello surprised RC51 by announcing the publication of a Spanish book on *Cybernetics*.

In this newsletter special attention is given to a panel discussion at the conference about the use of mathematics and formalization in sociocybernetics. The idea was to get sophisticated opinion of advocates and opponents of formalization in sociocybernetics. The discussion was chaired by Michael Paetau from Germany and started by the members of the panel: José

Amozurrutia from Mexico, Bernd R. Hornung from Germany, Pavel Luksha from Russia, Cor van Dijkum from the Netherlands, and Hector Zamorano from Argentina. A lively discussion was the result. Arguments about the sense and nonsense of quantification, qualification, the use of mathematics and formalization were exchanged among the participants of the discussion, as well as in the forum and in the audience. It seems to be a successful start of a discussion that in most of the social sciences is doomed to end in ideological fights without any quality. As an editor of the newsletter I am happy that in the following article Pavel Luksha and Bernd Hornung took the effort to transcribe some of the elements of the discussion. As a reader you are invited to read it carefully and add your thoughts in our next newsletter.

### **Some Reflections on Formalization in Social Sciences and Sociocybernetics**

*by Pavel Luksha and Bernd R. Hornung*

At the 5th International Conference of Sociocybernetics, "Social Knowledge for the Contemporary World", held in Lisbon, Portugal, July 26-31, 2004, a panel discussion was organized about "The Formalization of Sociocybernetics". This initiative was taken because formalization and mathematization, including the use of computer models, was considered, on the one hand, as a topic which has always been present in the conferences and papers of RC51 and the systems and cybernetics groups preceding it, and which, on the other hand, seems to have lost salience and visibility within this group over the last few years.

Participating on the panel, chaired by Michael Paetau (Germany), were José Amozurrutia (Mexico), Bernd R. Hornung (Germany), Pavel Luksha (Russian Federation), Cor Van Dijkum (The Netherlands), and Hector Zamorano (Argentina).

After a round of short programmatic statements and a brief illustration of what can be done by means of computer modeling by José Amozurrutia, a lively and controversial discussion developed which included the audience. The panelists insisted on the desirability of formalization, but at the same time they also pointed out its considerable difficulty. It was stressed that not all of the phenomena of the social sciences and sociocybernetics lend themselves equally well to formalization, sometimes for quite different reasons. Therefore, the necessity for a set of graded methodological tools, from logically structured verbal accounts via conceptual models and qualitative computer models to quantitative mathematical (computer) models, was emphasized. This might permit the avoidance of one of the major mistakes in attempts at formalization, i.e. forcing both data and available social theory into a preconceived procrustean pattern provided by the tool of formalization which happens to be at hand.

A look into the literature and the history of science shows that the need for mathematical formalization in the social sciences has long been debated. Some scholars argue that until a mathematical formalism is employed, a discipline is not yet a science. Others point out the extreme complexity of social systems, for which any formalism could be an unbearable simplification and reductionism. There are several arguments in favor of formalization:

- (a) Mathematics embeds formal logic: formal logic permits turning vague claims, which are so common in the social sciences, into precise and specific statements, which are thus falsifiable and comply with Popper's criterion for scientific theories.

- (b) Use of standard mathematical models allows for a common theoretical basis: the same theoretical concepts, notions and measurable indicators have to be used. Therefore results gained by different scholars can easily be compared.
- (c) Possibility of checking and screening: unlike verbal statements, mathematical statements can easily be verified and checked with regard to their logic, quality, and novelty.

Therefore formalization has its advantages. However, one should also learn from the experience of a social science that has been formalized to some extent for a long time already—economics. This social science has been caught in a trap lately as a consequence of the strong application of mathematics (Hodgson 1997). On the one hand the share of economic papers in major journals that discuss theoretical foundations and experimental findings without using standard formalisms has dropped to nearly zero. On the other hand, most strikingly, any findings that can seriously question the formal foundations of the theory are rejected. It can be recommended to revise or to neglect the facts, but not to question the theory! Institutionally this leads to an enclosure of mainstream economists in their own departments and journals, while non-orthodox economists and business practitioners shift to departments of management and to business schools, where less formalism and more relevance to reality is required.

One aspect of the formalization of mainstream economics that has been intensively criticized is the utilization of 19<sup>th</sup> century mathematics. This kind of mathematics has been applicable to studies of movement and thermodynamics, but not to complex social processes (Mirowski 1989). However, in the more recent past new methods have been developed, that are judged as more relevant to social studies (Malinetsky and Potapov 2003), e.g.:

- (a) Non-linear analysis and synergetics;
- (b) Computer simulations, e.g. neural networks, cellular automata, etc.;
- (c) Complex simulation systems, e.g. multi-agent systems;
- (d) Mathematical tools used by chaos theory and catastrophe theory.

There is a growing literature on the application of these methods, in particular in social sciences such as economics, sociology, political science, demography, and psychology.

The main issue that has to be posed as a challenge for sociocybernetics is: what is to be formalized? Coming back to the example of mainstream economics, it was not until its major theoretical concepts of 'supply', 'demand', 'resource', 'price', and others had been forged, that economics became capable of bringing in and applying successfully any serious mathematical modeling. As a social science, economics passed through some two centuries of verbal discussions before it could formalize its approaches, and still it is very likely that this is not yet the end. Sociology, being a comparatively younger science, may still require time.

Accordingly, one precondition of formalization in sociology, and its sociocybernetic branch in particular, is a precise, specific, and uniform terminology in combination with clear theoretical concepts that can be formalized. A second precondition is a sensitivity and awareness of the extent to which the different issues and different (parts of) theories lend themselves to formalization and the extent to which the need for data can really be met. First attempts to construct mathematical models or computer models are unlikely to produce any novelty. Rather they tend to shape and reshape what is already known. One advantage of sociocybernetics is, obviously, the utilization of cybernetics, which has its own long history of

formal modeling. A second advantage is that systems and cybernetic theory provide both a common terminology and a common theoretical framework to all sciences, social and natural, which are based on systems and cybernetics. This is not the case in sociology proper, which even has problems in communicating across different sociological paradigms. However, this does not mean that the task is already accomplished for sociocybernetics, as indeed the discussion in Lisbon has shown. The general systems and cybernetics frameworks still need to be specified and concretized for sociology and the other social sciences. At this level, the level of sociocybernetics proper, still a lot of work remains to be done with regard to the integration, homogenization, unification, and synthesis of the different approaches and areas of work existing within Sociocybernetics, the scope and diversity of which could be observed during the Lisbon conference.

To achieve the formalization of sociocybernetics, application not only of cybernetic notions but also of formal cybernetic models has to be encouraged. An appropriate development also requires the synthesis of existing cybernetic approaches and their integration with existing notions and concepts of social sciences, as attempted by Hornung (2003).

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## 2.2 Calls for Participation and Upcoming Conferences

### **International Journal of Agile Systems and Management (IJASM)**

Special Issue on: "Agile Mechanisms and Systems across Different Levels of Organisational Complexity." Guest Editor, Dr. Dimitrios Tsagdis, University of Hull, UK.

Agility manifests itself in different levels of organizational complexity (e.g., at the company level, in clusters and industrial districts, in specific industries, in regional systems of innovation, and in national business systems). Moreover, there are benefits to be accrued from agility in all of these levels. For example, a firm located in a region or a country with labor market or institutional agility may gain a competitive advantage over firms located in less agile environments.

What appears to be lacking, however, are ways of systemically and systematically exploiting agility at these different levels of organizational complexity. In trying to do so, one has to face a cascade of difficulties, starting from the fact that agile mechanisms and systems

not only manifest themselves in different ways across different levels of organizational complexity but also across different spatial localities. This in turn produces difficulties in researching such agile mechanisms and systems, as this often requires more than one discipline, which in turn brings forth novel difficulties (e.g., of disciplinarian imperialism, linguistic structures, etc.).

What is thus proposed is a special issue aiming to capture agile mechanisms and systems across different levels of organizational complexity, spatial localities and disciplines. Of particular interest are papers: comparing agile mechanisms and systems, for example in different companies, clusters and industrial districts, industries, regions, and countries dealing with agile mechanisms and systems in developing economies (especially Africa, Central and Eastern Europe, and China); addressing differences and similarities in agile mechanisms and systems of MNE subsidiaries, firm branches, multiple retail outlets, and decentralized governmental bureaus (e.g. Regional Development Agencies); linking agile mechanisms and systems across different levels of organizational complexity and/or across spatial localities (e.g., how national agile systems and mechanisms influence regional and/or company agile systems and mechanisms as well as vice versa); dealing with the same agile mechanisms and system from the perspective of more than one discipline

This is a first attempt to capture the range and variety of agile mechanisms and systems across different levels of organizational complexity, spatial localities and disciplines, as well as getting a handle (hopefully more than one) on the issues they raise, the difficulties to be encountered, their commensurability, and the ways to exploit or improve them.

Depending on the progress accomplished in this special issue, there are visions for subsequent ones trying to distil what may be "generic" in such mechanisms and systems. Obviously, any "early" papers pointing towards such directions are equally welcome.

### *Subject Coverage*

The special issue will cover a range of issues and topics, including, but not limited to:  
Differences and similarities of agile mechanisms and systems across different levels of organisational complexity (e.g., firms, clusters and industrial districts, industries, regional and national systems);  
Differences and similarities of agile mechanisms and systems across different spatial localities and stages of economic development;  
Methodological papers for researching agile systems and mechanisms across different levels of organizational complexity, spatial localities and disciplines;  
Theoretical explorations and models of agility aiming to unify, account, etc. for the encountered variety.

### *Notes for Intending Authors*

All papers are refereed through a double blind process. A guide for authors, sample copies and other relevant information for submitting papers are available on the *Papers Submission* section under [Author Guidelines](#)

To submit a paper, please go to [Submission of Papers](#). Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere

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To send THREE copies of each manuscript (in hard copy) or one copy in the form of an MS Word file attached to an e-mail (details of both formats in [Author Guidelines](#)) to the following: Dr. Dimitrios Tsagdis, Guest Editor, Business School, University of Hull, Filey Road, Scarborough YO11 3AZ, UK, *Tel:* +44(0)1723 357232 *Fax* +44(0)1723 357119, *E-mail:* [d.tsagdis@hull.ac.uk](mailto:d.tsagdis@hull.ac.uk) with a copy to: Editor-in-Chief IEL Editorial Office, PO Box 735, Olney, Bucks MK46 5WB, UK, *Fax:* +44 1234-240515, *E-mail:* [ijasm@inderscience.com](mailto:ijasm@inderscience.com)

Please include in your submission the title of the Special Issue, the title of the Journal and the name of the Guest Editor. Deadline for submission of papers is 1 May 2005

### **The International e-Journal of Abstracts for Cybernetics and Systems Research**

The International e-Journal of Abstracts for Cybernetics and Systems Research (IeJaCSR) (<http://abstracts.ifsr.org/bdbss2.php>) of the International Federation for Systems Research (IFSR) ([www.ifsr.org](http://www.ifsr.org)) is a collection of bibliographies from the field of knowledge in cybernetics, systemics, systems sciences, systems research both scientific, applied, and revealing practical experience. IeJACSR is intended as a meeting place both for peers, scholars, newcomers to cybernetics and systems and young people looking for an interesting devotion in knowledge and education. IeJACSR, as its name says, is a journal of abstracts, i.e. it is not designed to publish full texts. IeJACSR is an electronic journal allowing the Internet access to a Bibliographic Database, which consists of items=records, each containing one bibliographic unit (BU), extended for better search comfort (as listed below). The main field for each publication is the title.

The role of a Journal of Abstracts is well known in many sciences. In many natural, engineering and medical sciences they have been assisting both scientists and practitioners to collaborate, communicate, exchange knowledge, find joint interests and applications, acknowledge ideas and solve problems. Systems research is getting a stronger impact in many domains of life and science, the number of publications grows, research fields differentiate, and knowledge compounds diverge from one another to meet and adhere to new ones. IeJACSR aims at consolidating scientific and applied knowledge of an emerging young domain of science with increasing implementation wherever systems occur and are designed. Its database is intended to be both contemporary and retrospective.

A fundamental principle of IeJACSR is that the abstract/annotation should be written by the author him/herself. Thus, it is her/his responsibility for content, for personal image making, etc. IeJACSR includes in the database bibliographic data about publications (peer-reviewed together with abstracts before being published), be it a contribution at a conference (or similar event in science and education) or an article in a book of articles/chapters/contributions by different authors (the book/proceedings volume is a separate BU) or a peer-reviewed e-publication of any kind, or an article in a journal. In the latter case a number of journals and publishers are chosen to keep track of. However, cybernetics and systems sciences publish also very interesting and valuable papers in books, journals, etc., targeted to other domains of knowledge as first priority. That is, a knowledge domain is

evidently emerging as second priority in many (or all) others. Hence, the support of organizations like the RC 51 on Sociocybernetics, or other member societies of the ISA, IFIP, IFAC, etc., of the member societies of the IFSR, some institutes and many others, already taken note of in the IeJACSR database, will play an essential role in the process of qualifying and selecting publications.

Except for the title, which may optionally show a link to the full text, all other data are optional. But the better the description the broader the audience that finds and wishes to read it. The extended bibliographic unit (BU) includes:

Author(s) (all of them with affiliation(s), link(s) and address(es)),  
 Title [mandatory], subtitle, link(s), proceedings/book-collection of articles/journal/etc.,  
 link(s), publisher, link(s), vol. ... no. ...., number(s) of pages,  
 ISSN or ISBN, price, etc.,  
 Abstract / annotation (preferably up to 300 words),  
 Keywords,  
 List of contents, if a book/proceedings volume.

We prefer to receive BUs in the text body of an email or in MS Word (.htm or .html texts may include control signs, which we then have to bug-out.). Later on, a registration form will show the fields. However, it will be for authorized access only.

The IeJACSR team expects authors to inform us, when they have published a (conference) paper (probably after having enhanced it by the results of the conference discussion) in a journal of their choice, with or without changes in the title. Or when a link to full texts expires. Neither can we technically and physically address every single author on these issues, nor is it economically feasible. In parallel, it may happen that by our selection process we come across such a publication. This creates unnecessary duplications. If we are informed by an email by the author/editor, we will carry out the proper tests, and thus make the process more efficient and secure. As the editor of the IeJACSR I am supported by a team, which consists of a few brilliant young persons who are highly motivated by the feeling of being personally needed and respected.

Magdalena A. Kalaidjieva, PhD, IeJACSR Editor, PO Box 119, Sofia 1000, Bulgaria  
 Tel. 359 2 9884030, [kalaidji@mbox.cit.bg](mailto:kalaidji@mbox.cit.bg), <http://abstracts.ifsr.org/bdbss2.php>

### **Project: Mathematical Model of the Rise and Fall of Interacting Social Groups**

The dynamics of social groups is one of the most general and fundamental problems of sociology. The interaction between the individuals generated by material, emotional, and mental needs and desires concerning different aspects of life lead to self-organization within society and the formation of social structures. The groups forming such structures can belong to different sectors of social life. But there exist common structures and a common kind of dynamics within and between all sorts of groups.

Because of the importance of the phenomenon of group formation there does exist an extensive literature about this problem (Burt R., 1982; Coleman R., 1990; Collins R., 1988; Durkheim E., 1915; Hechter M., 1987; Homans G.C., 1950, 1974; Parsons T., 1951, 1967; etc). A systematic approach to modeling, not static but dynamic, behavior of social groups was

formulated by W. Weidlich.

The proposed project is based on the methodology presented in the monography of this scientist (Sociodynamics 2000). A mathematical model of group dynamics can only be a projection of the full qualitative conceptualization of this process to the character and the evolution of a few variables. In our case they characterize the group on the meso-level. Although the group-purposes and group-ideology are the driving forces behind group-evolution they do not show up explicitly but are hidden in the formalization of the motivations and decisions of the group members. Thus, the model captures only those features of group evolution that, independently of concrete purposes and ideologies, are always existent and comparable.

According to the structure of social systems, the model design will connect the microlevel of decisions and actions of individuals, which are intentionally driven, and the macrolevel of evolution dynamics of groups. The cyclic relation between the micro- and the macro-level is modeled in this contribution. The main purpose of modeling group dynamics is to derive in a consistent manner dynamic equations for the evolution of relevant variables ("key-variables" or "order-parameters") at the macro-level of the system.

The main goal of the project is to create a parsimonious mathematical model of a number of key-variables and trend parameters. It will be applied in such a way that the interpretative transparency is preserved. Simultaneously it should be generic and robust.

*The working steps of the project are:*

- to define the configuration space of macro-variables, collecting data and solving clusterization tasks;
- to describe elementary dynamics with interpretation of the transition rates;
- to develop equations of evolution for the macro-variables (equations for quasi-mean-values);
- to simulate and interpret selected scenarios of bifurcation and cyclic dynamics (A), chaotic dynamics (B), and delusive long term stability (C).

Our NIS-team consists of mathematicians and programmers (Uzbekistan, Belorussia). We need two European partners; at least one of them should be a practically experienced sociologist. Contact: Prof. Fatima T. Adilova, Uzbekistan, E-mail: [fatima\\_adilova@ic.uz](mailto:fatima_adilova@ic.uz) or [fatima\\_adilova@rambler.ru](mailto:fatima_adilova@rambler.ru).

### **6th International Conference of Sociocybernetics Sociocybernetics and Innovation**

*Maribor, Slovenia, 6-10 July 2005*

*The conference is an independent part of the 13th International Congress of Cybernetics and Systems of WOSC (World Organisation of Systems and Cybernetics).*

About the conference theme:

Sociocybernetics is about preconditions, ways, and consequences of impacts in social entities. Innovation is every novelty accepted as beneficial by its users or consumers, be it technological or non-technological. Social innovation aims at satisfying new needs not taken

care of by markets while economic innovation concerns new ways of production or exploiting markets. Social as well as economic innovations are usually the result of a combination of organizational (managerial), technological, and institutional innovations. Only one percent of patented inventions, usually technological inventions, become innovations. An unknown small percentage of the other inventions become suggestions and about seven percent of those become innovations. Technological development is interdependent with organizational development and they are both interdependent with social development from the local to the global level of world society. Innovation, the chance of success of which is eight percent, is at the core of all development. Different local, regional, and national communities are differently supportive of invention-innovation processes and the diffusion of their results. Inventions normally become innovations in coalition with entrepreneurship, and they fight routinism as a characteristic of social groups and social actors. Thus innovations lie at the core of the currently growing difference between the twenty percent of the affluent and the eighty percent of the poor and relatively poor of humankind of today.

At all levels, from local to global, it is not clear to what extent an innovation is indeed beneficial beyond evident short-term benefits. Side effects and feedbacks across a variety of different social subsystems, long-term effects impacting future generations, and phenomena of synergy and emergence may easily produce unexpected, unrecognized, and unwanted results endangering the sustainability of social systems and society at large. In the same direct or indirect way, however, innovations may indeed provide new solutions to the problems of human beings and society, e.g., globalization may be both a progress and a neocolonization at the same time.

Sociocybernetics as a discipline provides an adequate holistic theoretical and methodological framework to study the complexity of innovation processes and their effects on sustainability from the local to the global level. Papers are invited which deal with any one of these phenomena while being concerned with innovation. Preferred are papers which take an explicitly holistic and interdisciplinary approach and which take into account feedback, communication, and reflexivity. As the conference will address a wider scientific public from Slovenia and neighboring countries, applied studies will be of special interest.

#### *Venue and accommodation*

University of Maribor, Maribor, Slovenia (EU). See map at the end of this call for papers. The closest airports are in Graz, Austria, and Ljubljana, Slovenia. Trains connect Maribor with Vienna, Austria, Budapest, Hungary, Zagreb, Croatia, and indirectly with all places in Europe. There are student dormitories, a university hotel, and a number of other hotels in Maribor.

#### *Conditions of participation*

To present a paper, membership in RC51 is preferable.

Conference fees are:

- RC51 Non-members EURO 200 (250 EURO if no paper is presented);
- RC51 affiliated members (non-ISA): EURO 150;
- RC51 regular members in good standing (ISA and RC51): EURO 100;

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

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

#### *Abstracts and 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](mailto:eva.buchinger@arcs.ac.at), to Matjaz Mulej [mulej@uni-mb.si](mailto:mulej@uni-mb.si), and to the President of RC51, Bernd R. Hornung [hornung@med.uni-marburg.de](mailto:hornung@med.uni-marburg.de). The Abstracts Committee will review the detailed abstracts and will decide about acceptance. Possibly it will suggest improvements and modifications, in particular in order to ensure compliance with the conference theme. Abstracts have to deal with one of the major subjects mentioned above and should fit well with the overall objectives of this conference.

#### *Deadlines*

October, 20, 2004: Declaration of intent.  
 January, 20, 2005: 500-1000 word *detailed abstracts* and 250 word *regular abstracts*.  
 March, 1st, 2005: Notification of acceptance.  
 May, 20, 2005: Definitive registration and booking.  
 June, 20, 2005: Full paper.

#### *Contacts and information*

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

Felix Geyer, Honorary President RC51	<a href="mailto:geyer@xs4all.nl">geyer@xs4all.nl</a>
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National Organizing Committee:  
 Tel.: + 386 2 22 90 262; Fax: + 386 2 25 16 681

Matjaz Mulej [mulej@uni-mb.si](mailto:mulej@uni-mb.si);

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



### **The 37th World Congress of the International Institute of Sociology (IIS) ISA - RC51 on Sociocybernetics Session(s)**

*Stockholm, Sweden, 5-9 July 2005*

This session provides an opportunity to discuss the theoretical problems of modern sociological systems theory as well as its usefulness as a framework for the empirical analysis and explanation of complex social phenomena. Papers that focus on theoretical and empirical issues concerning particular social systems, such as politics, the economy, science, education, the mass media, art, etc., are also welcome.

If you wish to present a paper in the session "Sociological Systems Theory: Limits and Possibilities", send an abstract of no more than one page to Vessela Misheva: [Vessela.Misheva@soc.uu.se](mailto:Vessela.Misheva@soc.uu.se)

RC51 organizer: Vessela Misheva  
 Email: [Vessela.Misheva@soc.uu.se](mailto:Vessela.Misheva@soc.uu.se)  
 Website: <http://www.scasss.uu.se/iis2005>

### **6th European Congress on Systems Science**

Session(s) on Sociocybernetics : Social Complexities from the Individual to Cyberspace  
*École Nationale Supérieure des Arts et Métiers (ENSAM), 151 Blvd. de l'Hôpital, F-75013,  
 Paris, France, 19-22 September 2005*

Organized by: Association Française de Science et des Systèmes Cybernétiques, Cognitifs et Techniques)

RC51 organizer: Danièle Bourcier  
 Email: [bourcier@msh-paris.fr](mailto:bourcier@msh-paris.fr)

**International Sociological Association World Congress**  
**The Quality of Social Existence in a Globalizing World**  
*Durban, South Africa, 23-29 July 2006*

Program Coordinator: Karl-Heinz Simon.  
Email: [simon@usf.uni-kassel.de](mailto:simon@usf.uni-kassel.de)

Watch the RC51 website <http://www.unizar.es/sociocybernetics/indice.html> for call of papers.

### **3. SOCIOLOGY IN BIELEFELD**

We are pleased to announce that our RC51 member, and former active member of the Working Group on Sociocybernetics of the Dutch Systems Group, Raf Vanderstraeten temporarily occupies the chair of sociology in Bielefeld, formerly occupied by Niklas Luhmann.