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Basic concepts in social sciences III

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Basic Concepts in Social Sciences III

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Abstract

In this paper the set of concepts considered to be basic to the fields of Economics, Organization Theory, Political Science, Psychology and Sociology is completed. The set of 55 basic concepts in the first two papers on basic concepts was mainly determined by considering concepts in relation to social atoms. The concepts that play a role in n-networks form the majority of the concepts added in this paper.

Key words: social atom, goal, factor, standard issue network.
2000 Mathematics Subject Classification: 05C99, 91C99

1 Introduction

The reader is referred to the author's first two papers in this series for terminology and a set of 55 basic concepts, [2] and [3].

Most of these concepts were on the *micro-level* and concerned the modeling of the *social atom* by an *automaton*. *Macro-level* concepts discussed in the first two papers were *issue groups*. Any issue shared by a subset of the *population* P of the *social universe* U determines an issue group. Issues, displayed by about 800 concepts from the five fields of social science considered, were mainly of type *activity*, *decision*, *goal* and *feature*. This led to the definition of *system*, *decision group*, *organization* and *class*, respectively.

Social structures were considered in the second paper as resulting from processes and (inter)actions. They are *substructures* of society. The way these substructures arise is by superposition of *goal networks*. We recall the example of a goal network given in [3].

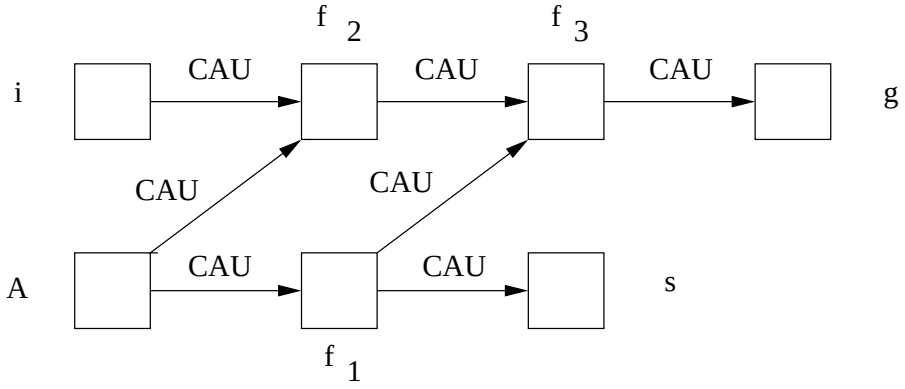

Figure 1 : A goal network

Recall that actor A wants to change some *goal issue* g, and can do this by influencing two issues f_1 and f_2, that are only intermediate issues and are called *factors*. Changing the status of f_1 and f_2 may lead to a change in another factor f_3, that may achieve the required change in the goal issue g. This process takes place within society and therefore a *side effect* in s may occur and from society and the surroundings some *influence*, due a change in i, may be felt. In Figure 1 only an influence on f_2 was drawn but all issues may in fact be influenced, including the goal issue and actor A. The influencing is represented by arcs with label CAU, of *causation*.

Definition 2.1 in [2] defined *sociology* as the study of interacting goal networks, but in fact we consider all social sciences to be that. In Figure 2 we give a *standard issue network* (SIN).

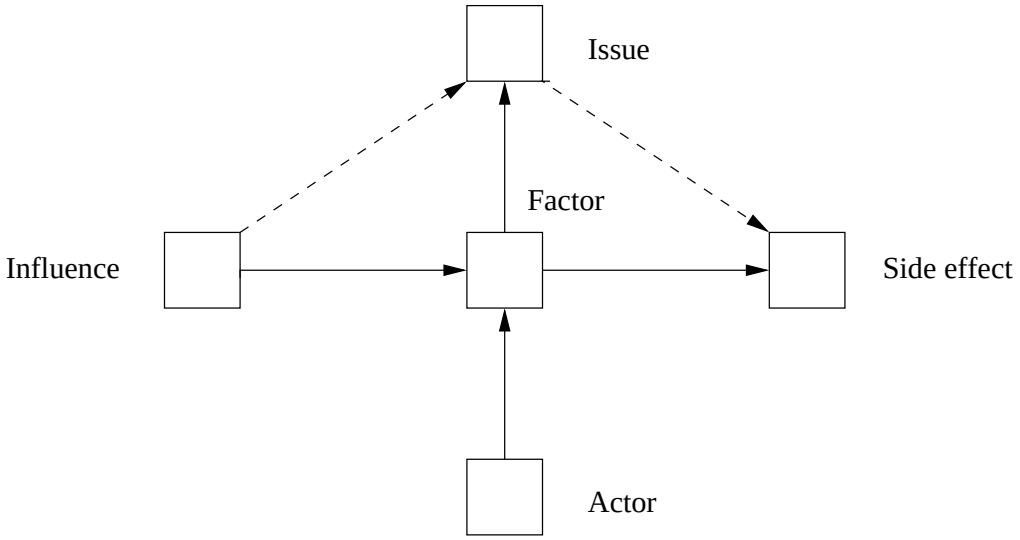

Figure 2 : Standard Issue Network

The graph should be read as follows.
The actor is to be seen as a social atom, a unit on the micro-level. The factor of the SIN stands for the whole network the actor has designed to influence, arcs are of type CAU, some issue which may be the direct goal issue or an intermediate goal issue. We called them factors in Figure 1. The dotted arcs indicate possible influences on the factor and the (goal) issue as well as possible side effects due to changes in factor and (goal) issue. Figure 2 describes a SIN on the micro-level. Both influence and side effect vertices stand for the collection of influencing issues and the collection of side effects. A SIN on the macro-level is given in Figure 3.

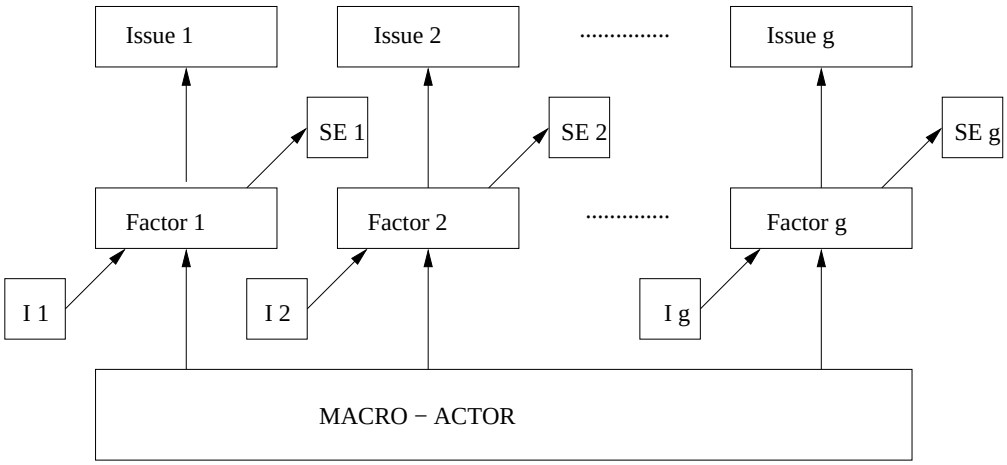

Figure 3 : Macro-SIN

In Figure 3 all kinds of overlap may occur. To mention one important overlap, the side effect of one factor, used to achieve a change in a certain (goal)issue, may be that some other (goal)issue is seriously influenced. So one man's goal may be achieved with a designed factor network that leads to a side effect that hinders another man's achievement of his (goal)issue change.
Note that the micro-SIN may be the goal network of a single social atom, but yet the (goal) issue may be a complex set of issues. The macro-SIN may be seen as the whole of society but may also be the SIN of some much smaller action group of only a few actors. The goal issue of a (micro-) social atom may be (part of) one of the goal issues of a (macro-) social "molecule".
The distinction made between micro-SIN and macro-SIN has consequences for those concepts that are relevant for n-networks. The investigation of concepts, to be described in the next section, profited much from the micro-macro-distinction.

2 The search for further basic concepts

After establishing the set of 55 concepts in the second paper, still more than 600 concepts remained to be investigated. The main reduction took place by deleting those concepts that were too specific. The list of concepts should be of such a general nature that domain-specific concepts do not occur. A concept like *firm* is domain-specific with domain economy. A firm is an organization, which is a concept that is used in more domains than one.
Comparing the lists of concepts of two domains, say organization theory and sociology, yields a set of concepts mentioned in the lists of both domains. This can be done for all five domains studied and yields a set of concepts mentioned in at least two domains. Next to these there are concepts that are non-domain-specific but are only mentioned in one list. These two sets together still gave several hundreds remaining concepts.

Like in any taxonomy, concepts can be dominated by other concepts. When dominated, by any of the 55 concepts we had determined already, the concept was deleted from the lists which gave a substantial reduction.
As might be expected from the fact that we stressed the micro-level concepts sofar, mainly concepts concerning the structure of society remained. The distinction between micro-SIN and macro-SIN led to a grouping of concepts into macro-concepts, micro-macro-concepts, macro-micro-concepts and micro-concepts. Next to these groups, groups of concepts having to do with processes, with information and a rest group, mainly consisting of measures, were distinguished. As an example of a micro-macro-concept we should mention *participation*. Typically a micro-actor chooses a goal issue, identical with that of a macro-actor. This links a micro-SIN with a macro-SIN. The intended goal issue change may be in

line with that of the macro-actor, in which case we speak of *cooperation*. This is usually the case. There may, however, also be situations in which the intended goal issue changes differ and we speak of a *conflict*. In the context of the two linked SIN's the following 24 concepts could be given an interpretation.

Action	Competition	Institution
Adaptation	Concentration	Interest group
Aggregate	Conflict	Participation
Association	Cooperation	Role
Cause	Dependence	Social choice
Circumstances	Deviation	Solidarity
Coalition	Figuration	Strategy
Community	Function	Surroundings

Table I
A set of concepts related to the macro-SIN consisting of a micro-SIN linked with a macro-SIN

Most of the concepts in Table I are candidates for extending the list of basic concepts. These 24 concepts formed a subset of a set of 65 remaining concepts. The next step was to consider the majorizations in the taxonomy of concepts as well as the way concepts were related according to the definitions given for them in two dictionaries, [6] and [7]. Note that in this paper too definitions will be given, according to our view. But at this point of the investigation the found definitions, almost always different for the two dictionaries, were only used to get a clustering of the concepts.
One cluster, of 8 concepts, fell under the heading *social system*, see Table II, including concepts like *exchange*, already mentioned in the list of 55 concepts.

(Change)	Growth
Control	Migration
Diffusion	Sanction
Equilibrium	Social control
Exchange	Social system

Table II
Concepts centering around the concept social system

The concept of *change* is added as it is basic for the description of dynamics. Likewise the concept of *grading* is added in Table III.
Another cluster, of 9 concepts, see Table III, was found around the concept *inequality*.

Equalizing	Integration
(Grading)	Leadership
Heterogeneity	Position
Hierarchy	Primary group
Inequality	Social order

Table III
Concepts centering around the concept inequality

A third cluster, of 5 concepts, see Table IV, centered around the concept *dimension*.

Dimension
Majority
Minority
Size
Type

Table IV
Concepts centering around the concept dimension

The remarkable finding is the dominance of the concept of inequality. In fact, this concept may be the most important concept of all, as it may not only be considered in the social network setting on the macro-level, but also in the setting of issue sets of actors, so on the micro-level. Most of the concepts of type measure have some kind of inequality at their basis. We give a list of determined measure concepts in Table V.

Centrality	Differentiation
Complexity	Diversity
Conentration	Heterogeneity
Conformity	Inequality
Democracy	Mobility
Density	Similarity
Stratification	

Table V
Concepts of type measure

Some remarks are due here. *Democracy* is not a domain-independent concept, it clearly belongs to political science. However, it is a very much discussed concept

and, what is important, it is seen as a measure! So are, for the time being, *concentration*, *differentiation*, *integration* and *stratification*. These concepts might also be seen as processes, but we choose to see them as measures for the structure resulting after these processes occurred. The concepts of *density* and *mobility* differ in nature from the other concepts.
Finally a set of 7 concepts was dropped for various reasons, mainly because they seemed concepts on a meta-level, like e.g. *symmetry*.
There was a rest group of 4 macro-concepts consisting of *collective behaviour*, *general interest*, *morality* and *social welfare*, that seem worthy to be kept in the list for the time being.

More than 50 concepts have thus been found that might be added to the list of 55 concepts, given in [3]. In the next section we will consider them in more detail and try to give definitions of those concepts that are included in the final list of concepts in terms of which a general theory might be developed.

Sofar our investigation has shown that our definition of sociology as the study of interacting goal networks gives the possibility of interpreting many terms used in social science and in such a domain-independent way that the study of n-networks might be identified with social science. Micro-SIN's and macro-SIN's is what it is all about. The concept of inequality seems to pervade many aspects and to have a very central position.

3 Definitions of new basic concepts

In this section we pursue three goals. First a choice will be made out of the concepts mentioned in Section 2. This means dropping the other concepts, if only for the time being. Second, the choice will be described in the setting of a view on social science, a theory in terms of the concepts that we consider. Third, this should also explain the definitions that will be given.

In the paper of Hoede and Weening [4], words ending on -ation or -ism were investigated for their causal relationships and their part-of-relationships. The main outcome was that among the processes (!) *integration* was the central dominating concept. Within that process *adaptation* was the basic process. We will start our discussion here.

Adaptation and its counterpart *deviation* play an essential role in the formation of social structures. Taking over values of others, and with that taking over goals of others, is seen as the essence of adaptation. As taking over ideal values means creation of tension, it leads to *participation* in goal groups. The extent to which the values of a (goal) group are taken over is measured by *conformity*.

Definition 1 Adaptation *of a micro-actor to a macro-actor is the choice of goal issues of the macro-actor.*

Definition 2 Deviation *of a micro-actor with respect to a macro-actor is the choice of issues of the macro-actor, but with valuations that differ.*

Definition 3 Participation *of a micro-actor in a macro-actor is the situation in which the micro-actor shares an issue with the macro-actor and creates a microSIN with respect to the issue.*

Note: usually participation is based on adaptation. As we want to discuss the measures separately, we will not give a definition of conformity here, nor of any other measure, for the time being. An interesting concept that is dropped is solidarity. It differs in a subtle way from adaptation in that it is essentially support for the value and goal issue choices made by others, without necessarily leading to any participation.

Equality of values and goal issues are the main ingredients for the measure (!) integration. A concept like equalizing has similarity with the process called integration, but is rather unclear and therefore dropped.
Society as a whole knows a set of values on issues, called *morality*, usually also coming forward in laws. Adaptation also contains a component with respect to morality. A concept like general interest is dropped because it is considered to be dominated taxonomically by morality.

Definition 4 Morality *is a set of issues and their ideal values, considered by a society and coming forward in mores and laws.*

Many structures are seen as arising from adaptation. The goal is determining the member actors. The *goal group* or *organization* is the structure that is created. Usually an organization is considered to have more aspects than a goal group. We consider the concept interest group to be a synonym of goal group and drop it. What is more in an organization is the *factor* created by a goal group. It describes how the goal group is "organized", as well as the whole resulting causal network designed for reaching the goal.
If a firm has producing goods as its goal, the various workers in the firm are organized in some way, controlling what is often called a "factory". However, factors can be created by individuals too, and the goal issue may lead to similarity in these factors, for example if the goal issue is to watch a soccer game. So the factor of a macro-SIN may show regularly returning patterns. For these we use the much discussed concept of *institution*.

Definition 5 *An* institution *is a returning pattern in the factor of a macro-SIN, usually governed by rules.*

The whole factor of a macro-SIN will continuously show changes. For a certain structure of the factor, at some moment, we will choose the term *figuration*, introduced by Elias.

Definition 6 *A* figuration *is the structure of the factor of a macro-SIN.*

In these definitions we see institutions as more or less stable, because returning, substructures of changing figurations. We restrict ourselves to the concept goal group and drop coalition, too much a politicological term, community, a kind of mini-society, association and aggregate, specific forms of a goal group, from our list of candidate basic concepts.

Within a factor of a macro-SIN actors play a *role*, a concept already chosen as a basic concept. We drop position as a synonym. The concept of role contains all types of relationships a micro-actor is involved in. Within the role the outgoing causal arcs have an important place. They determine the *function* of a micro-actor.

Definition 7 *The* function *of a micro-actor in the factor of a macro-SIN is his set of outgoing causal relationships within the factor.*

Being a member of a macro-SIN usually involves *action*, which, like e.g.*change*, is a very basic notion, giving the member a function. This function need not have to involve the main goal issue, but may involve an auxiliary or support goal issue, like e.g. the function of people working in the canteen of a firm.
Micro-actors having a function with respect to the same goal issue, with comparable valuation on the issue, are said to cooperate.

Definition 8 *Two actors within a macro-SIN show* cooperation *if their function within the factor involves the same issue and their valuations on the issue are conform.*

The actions undertaken are subject to external influences. These are called *circumstances.*

Definition 9 Circumstances *are external influences on the factor of a SIN.*

The concept surroundings is dropped. In as far as surroundings play a role they are circumstances.

The concept diffusion, a consequence of migration, is dropped. The *size*, a basic concept also outside social science, of a goal group will fluctuate. We drop the concept growth. Note that the factor figuration may be untouched by the changing membership. In particular the institutions may remain the same, as they are primarily determined by the goal and the *strategy* chosen to reach it.

Definition 10 *The* strategy *of the actor(s) of a SIN is the choice of the factor.*

A change in strategy may lead to a change in institutions.

Aspects of size, like majority or minority, are dropped, being less basic than the concept *cardinality* of a set, another general basic concept of type measure, taxonomically dominating "size", a concept that we will, however, keep for discussing goal groups. We already mentioned mobility as a measure for the migration process. A group or even society may show various other features for which measures can be given. Any such feature is called a *dimension.*

Definition 11 *A* dimension *of a macro-SIN is any feature for which a measure has been or can be defined.*

Definition 12 *The* type *of a group or society is the combination of features and their values, as given by their measures.*

The main cause for the occurrence of types is the very basic concept of *inequality*, also used outside the realm of social sciences. We will come back to this concept when discussing measures in Section 5.

Most of the candidate basic concepts have now been given and have been used to outline the theory. Of the remaining concepts we exclude the measures, for the time being. Taxonomic domination takes care of most of the other concepts. Social contract is a form of exchange, say money for work, and is dropped. For the same reason "sanction" is dropped. Hierarchy is a form of inequality and leadership refers to an aspect of hierarchy. Both are dropped, as is "dependence"

as part of *influence*.
Any part of a SIN may be experiencing different influences and yet remain unchanged in some respect. It is then said to be in *equilibrium* in that respect. The concept of equilibrium is also a basic concept for a wide scope of sciences. *Density* too is a measure, used e.g. in physics. Finally, *ranking* is mainly a mathematical concept, based on the concept of (partial) ordering, that is kept, for reasons analogous to those for keeping *size* as basic concept.

In this section we have given the definitions of 12 new basic concepts. We have also pointed out that several basic concepts are used also outside the realm of social science.

4 Are social sciences complex?

The reader may agree that the interaction of micro-SIN's leading to macro-SIN's gives the possibility to introduce quite a few basic concepts, but have the feeling that this interaction cannot be all that social sciences are about. Well, physics and chemistry are basically only about space, time, particles and fields and their interactions. They too are basically restricted in their set of basic notions, like energy, mass, charge, etc. The complexity comes in when the various combinations are considered, which is particularly clear in organic chemistry.

The situation in social sciences is not very much different. The complexity comes in when e.g. the set of possible issues is considered. Suppose one would like to carry out a computer simulation for a not too unrealistic model of a society. Which issues might be included? Doing a Google search on "factor analysis of goals" one finds a reference to Steven Reiss [5], who reports on "16 fundamental desires and values". These 16 fundamental desires are, quote,

1.	Curiosity	–	desire to learn
2.	Food	–	desire to eat
3.	Honor	–	desire to behave in accordance with code of conduct
4.	Rejection	–	fear of rejection
5.	Sex	–	desire for sexual behavior and fantasies
6.	Physical exercise	–	desire for physical activity
7.	Order	–	desired amount of organization in daily life
8.	Independence	–	desire to make own decisions
9.	Vengeance	–	desire to retaliate when offended
10.	Social contact	–	desire to be in the company of others
11.	Family	–	desire to spend time with own family
12.	Social prestige	–	desire for prestige and positive attention
13.	Aversive sensations	–	aversion to pain and anxiety
14.	Citizenship	–	desire for public service and social justice
15.	Power	–	desire to influence people
16.	Possession	–	desire to possess material goods

The remarkable aspect of these findings is the shortness of the list. Are there only 16 fundamental types of micro-SIN's? Note that *power* was not chosen as a basic concept, because of its political flavour. It is, however, certainly a concept, like *control*, that is only dropped for the time being.

Another view on the complexity of social science is given by the number of dimensions. We mentioned the dominating role played by the concept of inequality. A very interesting book on this is that of Blau [1]; Inequality and Heterogeneity: A primitive theory of social structure. The Appendix A of this book contains definitions of major terms, very much in line with the approach in this paper. Blau focuses on structure and we cite his Figure 1 on basic types of structural parameters:

Nominal Parameters	Graduated Parameters
Sex	Education
Race	Income
Religion	Wealth
Ethnic affiliation	Prestige
Place of work	Power
Place of residence	Socioeconomic Origin
Industry	Age
Marital status	Administrative authority
Political affiliation	Intelligence
National Origin	
Language	

So 11 nominal and 9 graduated parameters are mentioned as fundamental aspects of society on which the investigation of structure and structural change might be based. The nominal parameters are what we called features. Catholics e.g. form a *feature group*. The graduated parameters are features on which a *ranking* can be considered. Again not more than 20 parameters are considered, giving an indication how many parameters might be chosen in a realistic model of society. These numbers, 16 in the case of Reiss and 20 in the case of Blau, are remarkably low. One might argue that the number of combinations, and therefore the number of possible models of a society to study may explode. If we follow Reiss some 2^{16} goal combinations might be considered. But the most complex combination, considering all 16 fundamental desires, is unique and does not seem to lead to computational complexity problems for simulations. A macro-SIN with 16 goal issues is not a complicated thing. However, the different ways in which the factors are designed by the different micro-actors may be many. After all there are more than 6 billion of them on earth! The different designs lead to a large number of figurations. That is where the complexity of society has one cause. Another cause is the differences occurring on the valuations on the issues of different micro-actors.

5 The measures

We return to the measures mentioned in Table V. Mathematical definitions will be discussed in a separate paper. Here we want to discuss the diversity of verbal definitions of these concepts as a preparation of the mathematical ones. As reference we mention the two dictionaries [6] and [7], and the book of Blau [1].

a. *Centrality*

The dictionaries just remark that it is the noun describing "being central". Blau does not consider this concept, but does mention the concept of *status*. All three references equate status with *ranking*, i.e. a concept related to some ordering.
From a graphtheoretical point of view, in an unordered network of relationships centrality of a micro-actor may be equated with the *degree* of the representing vertex in the graph corresponding to the network. For example, if the network consists of one vertex connected to n other vertices, the "central" vertex has degree n, whereas the other vertices have degree 1.
For status many proposals have been made. I consider inequality of degrees to be at the basis of difference in centrality.

b. *Complexity*

This concept has not to do with inequality. The dictionaries define complex as something consisting of two or more parts. Complexity then is the state(!) of being complex. As a measure the number of parts is the most direct interpretation. Blau defines complexity as follows: "Structural complexity is a theoretical term referring to the number of positions in a multidimensional space and the distribution of people among them, which is inferred from the degree of intersection of parameters and the degrees of differentiation in various respects".
The problem we meet here is that various other concepts have to be defined first: "number of positions", "multidimensional space", distribution of people", "degree of intersection of parameters", "degree of differentiation". Of course, also the object considered is not mentioned. If it is "structure", then we may consider the figuration of a SIN and ask for a definition of its complexity. In graph theory the complexity of a connected graph is the *number* of its spanning trees. The complexity of an algorithm is the *number* of calculational steps it takes. So we might consider the *number* of positions, roles in our theory, that may be distinguished in a figuration. The fact that people may have the same position does not seem to make the figuration more complex. The distribution of people over roles seems less relevant for the concept.

c. *Concentration*

Blau defines: "The concentration of a social resource is equivalent to the degree of inequality in its distribution. In a footnote he states : "The empirical measure for inequality or concentration is the Gini-index...". One dictionary gives: "The relative amount of an ingredient".
Blau is not clear with respect to "social resource", but is clear in identifying concentration with "inequality of distribution". This already hints at the basic position of inequality, a concept that can be used for different other concepts, here the concept distribution. We may therefore drop concentration as a basic concept.

d. *Conformity*

Remarkably one dictionary gives "adapt oneself to" for the verb conform, the other "to be similar or identical with".
We defined adaptation as choosing the same (or similar) goal issues. Clearly there is an *equality* or *similarity* measure needed.

e. *Democracy*

This concept is very much discussed. A search on the internet for "definition of democracy" gives more than a million answers.
Here too, like in the case of complexity, one should restrict oneself and focus on a purely politicological setting, and possibly drop the concept as too domain-dependent. In this setting, equality (of power) may be considered.

f. *Density*

A social network implies a graph structure. The density of a graph is the number of present links divided by the maximum number of links possible. The concept is not related to inequality in some sense.

g. *Differentiation*

Blau defines: "Structural differentiation refers to the distribution of people among social positions, either in terms of a specific parameter or, as a theoretical concept, in terms of all parameters. Its main forms are heterogeneity, inequality and status diversity. As a theoretical term, it is essentially equivalent to structural complexity". The dictionaries give: "constitute difference between", [6], respectively "development of the one to the many, the simple to the complex, or the homogeneous to the heterogeneous", [7].
The concept of *difference* is not specific for social science and expresses the basic insight one can have about two somethings that they are not equal. We have met general concepts like this before and therefore drop it from our list. Note that the dictionaries see differentiation as a process, as in biology, but Blau refers to a state of distribution. We will focus on the main forms that he mentions.

h. *Diversity*

Blau defines: "Status diversity refers to the great number of different statuses among which a population is distributed. It is the graduated parameter equivalent of heterogeneity. Its minimum occurs when all persons occupy the same status, its maximum when every person occupies a different status".
Given n objects, the number of different objects being d, then d/n would be a measure of diversity. We drop this simple measure.

i. *Heterogeneity*

Blau gives an interesting definition. "...the probability that two randomly chosen persons do not belong to the same group". One dictionary [7] gives; "consisting of dissimilar ingredients or constituents".
We should stress the concept "genus" in "heterogeneous". Genuses differ in the properties that define the genus in a taxonomy. A group of persons is heterogeneous, according to Blau, if these persons mostly belong to different groups, as then the probability is high that two persons belong to different groups. We take over this definition of heterogeneity.

j. *Inequality*

We now come to the central concept.
Blau defines: "It is the average difference in relative standing, specifically, the mean status distance in a population, devided by twice the mean status, for any criterion of status". One dictionary [6] gives: "Want of equality in magnitude,

quality, rank, etc.".
The latter definition hints at the main difficulty. The inequality concept can be considered in different settings. One may consider a pair of items and see whether they are equal or not. Usually this is described by the concept difference. For a set of items one may consider sets without a ranking or with a ranking. The sets with ranking may have a finite set of values or have values that form a continuum. Blau refers to this latter case and mentions the well-known Gini-index for inequality, developed already in 1921 for income distributions.

k. *Integration*

Although this concept is usually seen as a process, there is some reason to see it as a measure. Adaptation leads to connections with society and to conformity with issues and values in society. But, like for the concept democracy, it is not clear what precisely is meant by integration. By focusing on the development of a measure the various aspects that can be taken into account should come forward. We can speak of an integrated society, but also of the (extent of) integration of a certain group in society. When do we say that a minority is maximally integrated in society?
Blau focuses on structural aspects and gives: "Macrosocial integration refers to extensive social associations among different groups and strata, either in terms of a specific parameter or, as a theoretical concept, in terms of all parameters. For specific parameters, it is defined by the ratio of observed intergroup associations to those theoretically expected on the assumption of independence".
There are some important words in this definition. First the word "macrosocial" tells that a measure is considered for society as a whole, i.e. for a macro-SIN. Second, if "all parameters" are considered, there may be different ways to deal with nominal parameters and graduated parameters. Third, "intergroup associations" focusses on a purely structural aspect of integration. These are choices made by Blau that make sense, but also mask the other aspects of integration.

l. *Mobility*

We considered mobility to be a measure of migration. There is no link to inequality as for most of the other measures. Migration clearly has a physical flavour. A macro-SIN may be considered to offer a huge set of slots, in the form of goal issues that may be chosen, that may be occupied by micro-actors or left open. Migration implies that a slot is filled one moment and left open the next moment, very much like flowers in a field are visited by a swarm of bees.

m. *Similarity*

This measure basically describes the (in-)equality of two sets A and B. These sets can be abstract sets or sets of properties of a micro-actor or a macro-actor. The standard approach is to consider $|A \cap B|$ and $|A \cup B|$, the number of common elements and the number of all elements. The quotient then expresses the similarity

of A and B. However, in certain settings other measures should be defined. It is useful to keep this measure in the list, although it is taxonomically dominated by the concept equality.

n. *Stratification*

Blau defines: "Social strata are any arbitrary divisions of the population on the basis of a status criterion. Equidistant strata are defined in terms of equal status intervals, not equal population percentages".
This describes what strata are, not to what extent a society is stratified. So, is stratification a measure? If we accept that strata are based on a status criterion, then the diversity of the status values seems to be the only sensible measure. We drop therefore stratification too.

6 The list of basic concepts

We can now produce a new list of basic concepts. Several concepts came forward that play a role in any science, like e.g. size. Such concepts are basic concepts, but will not be included, as we want a list of concepts in social science in terms of which a general theory can be developed, with results holding for any of the five fields we chose our concepts from. There may be some concepts missing, as the indices, of the five books the concepts were taken from, were incomplete. Nevertheless the impression is that the most relevant concepts have been gathered, many a concept being rather important in itself but dropped because it was too domain-dependent or taxonomically dominated.

In Table VI we have chosen the format of Table II in [3].

	NAME	NOTATION or REMARK
1.	Social atom k	A_k
2.	Issue	I
3.	Issue set of atom k	J_k
4.	Co-issue of I for atom k	$Co - I \equiv J_k - I$
5.	Universal issue set	$J_U \equiv \cup_k J_k$
6.	Issue group	$IG(I) = \cup_k \{A_k \mid I \in J_k\}$
7.	System	IG(activity)
8.	Organization	IG(goal)
9.	Class	IG(feature)
10.	Decision group	IG(decision)
11.	Social Universe	U
12.	Population	$P \in U$
13.	Social structure	$SS \equiv < P >$
14.	Society	$< U >$
15.	Perception of an issue set	Perc(J)
16.	Ideal of an issue set	Id(J)
17.	State of atom k	$Perc(J_k)$
18.	Valuation by atom k of a state	$v(Perc(J_k))$
19.	Valuation by atom k of an ideal state	$v(Id(J_k))$
20.	Tension of atom k on his state	$T(J_k) \equiv v(Id(J_k)) - v(Perc(J_k))$
21.	Normal social atom	Associated social atom
22.	Group norm	Average of valuations of normal social atoms
23.	Morality	$Id(J_U)$ and $v(Id(J_U))$
24.	Goal	J*
25.	Incentive	$\delta v(\delta J)$
26.	Hope for/Fear of δJ	$\delta v(\delta J) = v(J^*) - v(J)$
27.	Will	Choice amongst incentives

28.	Automaton	$M = (A, O, S, \tau, \omega)$
29.	Input alphabet	A
30.	Output alphabet	O
31.	Input	$(\delta J)_i \in A$
32.	Output	$(\delta J)_o \in O$
33.	Internal states	S
34.	Transition function	$\tau : S \times A \to S$
35.	Output function	$\omega : S \times A \to O$
36.	Identity of social atom k	M^k
37.	Behavior	(τ, ω)
38.	Personality	(S, τ, ω)
39.	Character	Preference ordering of states $J \in S$, determined by valuations
40.	Well-being	v(J)
41.	Conscience	Valuation of normal atom
42.	Utility of a change δI	$u(\delta I) = v(I^*) - v(I)$
43.	Price of a change δI	$P(\delta I) = v(co - I) - v(co - I^*)$
44.	Adaptation	Change of valuations
45.	Deviation	Difference of valuations
46.	Goal network	Designed process
47.	Standard Issue Network	Micro-SIN or macro-SIN
48.	Factor	Process part of SIN
49.	Function	Set of outgoing causal arcs within the factor of a macro-SIN
50.	Cooperation	Similarity of function and conformity of issue valuations
51.	Migration	Change of goal group by a micro-actor
52.	Strategy	Choice of factor
53.	Growth	Structure development
54.	Life	Development in time
55.	Promise	Virtual output δJ
56.	Threat	Virtual input δJ
57.	Trust	Hope on giving promise
58.	Attitude of A towards B	$v_A(B)$
59.	Support of B by A	$\delta v_B(J)$ due to acts of A
60.	Capital of B with A	Incentive of A to support B

61.	Role of atom k	R(k)
62.	Influence of A on B	An output $(\delta J)_o$ of A that entails an $input(\delta J)_i$ for B
63.	Circumstances	External influences on the factor of a SIN
64.	Side effect	Influence of factor on other issues
65.	n-network	Structure of n goal networks; macro-SIN without influences and side effects
66.	Participation	Issue sharing of micro-actor with macro-actor
67.	Figuration	Structure of the factor of a macro-SIN
68.	Institution	Returning structure pattern in the factor of a macro-SIN(usually subjected to rules)
69.	Exchange	Special 2-network
70.	Dimension	Feature for which a measure can be defined
71.	Type	Combination of features and their values as given by their measures
72.	Centrality	Based on inequality of degrees
73.	Complexity	Based on number of functions
74.	Density	Based on number of relationships
75.	Heterogeneity	Based on inequality of groups
76.	Inequality	Basic notion
77.	Integration	Based on equality of features
78.	Mobility	Based on change of participation
79.	Similarity	Basic notion

Table VI
Summary of basic concepts

Again the set of concepts has been grouped. One recognizes the following groups:

Concepts centering around the concept of issue (1-5)
Names of clustering on issue types (6-10)
General macro-level terminology (11-14)
Concepts centering around perceptions, ideals and valuations (17-23)
Concepts concerning motives to act (24-27)
Concepts concerning automata (28-35)
Concepts from psychology in terms of components of automata (36-39)
Concepts concerning valuation and changes in valuation (40-45)
Structural aspects of processes (46-54)
Concepts concerning virtual acts (55-57)
Concepts concerning interaction of social atoms on the valuation level (58-60)

Concepts concerning interaction of social atoms on the structural level (61-69) Concepts concerning measures (70-79).

Our investigation has mainly led to an increase of concepts concerning structural aspects per se and in particular of processes and of concepts concerning measures. The former list had 55 items. So 24 concepts have been added.

From here we first will make a mathematical study of measures and after that first theorems should be derived in terms of our basic concepts.

7 References

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