

# Individual Alienation and Information Processing: a Systems Theoretical Conceptualization\*

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## 1. Introduction

### 1.1 The problem

Even the most perfunctory review of the literature on alienation shows the abundance of alienation concepts currently in use. Their definitions are often vague, self-contradictory or overlapping. The concept has a different content in almost every one of the social sciences, partly because it is employed to explain such disparate phenomena as 'deviant' behavior in criminology, voter apathy in political science, schizophrenia in psychiatry, disturbances in interpersonal contacts in social psychology and powerlessness in sociology. Moreover, within each of these sciences several schools of thought develop their own concept; in fact, almost every author tries to do so.

This proliferation has certainly not resulted in a Maoist flower garden, nor has the extreme diversity brought about a great leap forward. The advantages of diversity disappear when nearly everyone conceptualizes alienation in a slightly different way, without bothering to specify the differences and similarities with the alienation concepts used by others. Research results are consequently difficult to compare, let alone to accumulate. These difficulties, in turn, impede effective theory building.

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## 1.2 Towards a proposed solution

An advance of alienation theory and research might be facilitated by an increase in conceptual clarity. Therefore, as usual in a 'rewriting' problem:

- a common denominator must be found for the forms of alienation distinguished in the literature – using the same term for these different forms does suggest some communality;
- their practical and theoretical differences (applicability range, degree of conceptual overlap) must also be clearly defined;
- this might be accomplished within the context of a (meta) model, that could be applied, amongst others, to alienation theory. The model, however, should not be derived from the theory, in order to preclude a too easily construed fit between model and alienation forms.

It is proposed here, and will be shown in the following, that some basic concepts of General Systems Theory can provide at least the beginnings of such a model.

## 1.3 The concept of alienation: Some similarities and differences

It is beyond the scope of this article to attempt giving here more than an extremely rough sketch of the main issues in alienation theory; besides, this has been done elsewhere in this volume already.

A reasonable amount of consensus seems to exist on the following points:

Alienation always implies a *relationship* between a subject or group of subjects and *some* aspect of their environment – as diverse as: nature, God, work, the products of work or the means of production, fellow men, (one-self), different social structures and institutions, etc. One can characterize this relationship minimally as one of *separation*; a separation that generally<sup>1</sup> must be considered *undesirable* from some point of view before one can speak of alienation.

Furthermore, alienation ultimately refers to a *subjective state* of an *individual* at a *given moment* (Seeman et al.).<sup>2</sup> Of course, this does not preclude its being caused by factors objectively existing in the environment (Marxist approach). Alienation can be measured by asking the subject how he feels and taking his word for it (the approach of Seeman et al., implying that the subject is aware of his alienated state), or by inferences drawn from his behavior under certain conditions by an outside observer (the Marxist approach, where the observer decides whether the subject is alienated or not,

while the subject may or may not be – or become – aware of his alienation, or may even deny – rightly or wrongly – having it).

## 1.4 Premises

Before a systems model can be introduced and related to the vast array of alienation concepts mentioned above, a few premises must be made explicit:

1. Human beings can be described as (personality) systems in continuous interaction with their environment. This implies that they have to select information from their environment, which should be relevant for reacting to or acting upon it, and also produce information for their environment. Information is being used here in the broadest possible sense of anything indicating any change in any aspect of the system's environment, but with the proviso that it be considered relevant by the system: information is, therefore, a relational concept, as is information-processing. In this broad sense it includes emotions, non-verbal signals and the like.
2. Alienation can be viewed as a generic term denoting different kinds of information processing disturbances.<sup>3</sup> It involves different deviations from an 'optimal' functioning of man as an information processing system, from something he apparently considers attractive or desirable.
3. Alienation therefore presupposes the existence of minimum-criteria, against which actual functioning can be compared. These criteria might be formulated in terms of a Weberian ideal type, or they might be derived from the system's history. Once having a set of criteria one can also indicate which classes and sub-classes of deviations from optimal information processing can be distinguished.
4. Combining the above three propositions, it follows that different forms of alienation can be equated with these classes of possible deviations.

The advantages of accepting these propositions should be clear:

1. A parsimonious classification of the existing forms and concepts of alienation becomes possible:
  - a. Because of the high abstraction level of the model to be presented – *any* system in *any* kind of interaction with *any* environment – different forms of alienation can be brought under one common denominator: information processing problems;<sup>4</sup>
  - b. On the other hand, a basis for distinguishing between different alienations is provided by concretizing within the model forms of possible deviations from optimal information processing;

- c. The model is derived from General Systems Theory. It therefore allows, in principle, a reformulation of alienation theory in terms of the constraints imposed by the systems approach, and has the advantage of being independent of the alienation literature.
2. The systems approach also has heuristic value. New forms of alienation, often described under different headings in the literature, can be discovered by following the implications of the model.

It should be noted here, that General Systems Theory is often accused by social scientists of fostering conservatism through its alleged emphasis on homeostasis, equilibrium, feedback, and stability rather than change. This reproach, however, is directed more to the 'old' systems theory introduced into the social sciences by the structural-functionalist school. Admittedly General Systems Theory deals with problems of order rather than of disorder. However, order, in the systems sense of negative entropy, has as little to do with stability as disorder has to do with change. General Systems Theory is not only applicable to morphostatic properties of systems, but also to morphogenesis of systems.

## 2. Man as an information processing system

Here, as in the following, we are concentrating on the *individual*, because he is the only system that can be aware of its alienation. Social structures, cultures, roles, institutions, etc. can also be described by the same model as systems interacting with an environment, and they can certainly show information processing disturbances. However, they don't even have a *potential* awareness of their own state, and therefore should not be termed alienated. Even assuming that a group of people can react as *one* unit to a *common* environment, this *group* cannot be called alienated – the *members* can, of course – as long as the individual brains cannot be neurosurgically coupled such that they act as one fully integrated information processing system. Evidently, individuals can be aware not only of their own position, but also of the position of the group they belong to; but in class consciousness, for example, it is not the class that is conscious, but the individuals belonging to it.

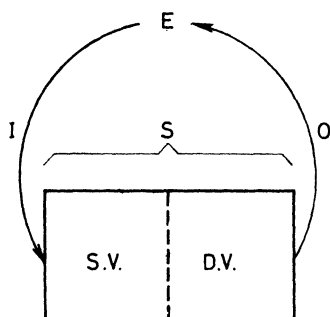
The above does not imply that the model presented here cannot be used to describe interaction between groups of people and their environment. In that case, however, it must be elaborated to reckon with the coupling problems between the individual subsystems. This certainly could be done, and admittedly it would constitute a more sociological approach. Yet, concentra-

tion on the individual instead of the group does not necessarily imply a psychological or reductionist bias.

Further investigation of information processing problems on the individual level may even be a precondition for eventually arriving at a more complex level of truly sociological analysis; this level is implicit in our model.

Furthermore, it should be made clear at this point, that the human individual as an information processing system is not compared with the trivial machine of automata theory, but with the finite-state machine, and especially with the Turing machine.<sup>5</sup>

The simplest possible way to represent an information processing system in interaction with its environment is depicted below:<sup>6</sup>



*S* = the *system*, in our case the individual. In systems terminology the system is often represented as a *black box*: one can see its boundaries, but one cannot see into it, one cannot directly observe its *internal structure*; this can only be inferred – by an outside observer, who himself forms part of the system's environment<sup>7</sup> – from the differences between inputs (*I*) and outputs (*O*).

*I* = *input*: a particular class of variables that can be observed on the system, signifying everything that is observed by the system in its environment. Loosely defined: all incoming stimuli.<sup>8</sup>

*O* = *output*: a particular class of variables that can be observed on the system, signifying everything that is observed emanating from the system by its relevant environment. The output – the system's behavior – can be either a reaction to or an action upon the environment. As should be clear from the circular model presented above, this depends entirely upon where one starts observing the chain: at the output or at the input. Starting at the input, we obtain a pre-Skinnerian behavioristic stimulus-response model:

$\xrightarrow{s(I)} \boxed{\text{System}} \xrightarrow{R(O)}$  , in which the system is viewed as reactive and non-innovative relative to the environment. Starting at the output, on the contrary, the system may be acting upon the environment in a manipulative and eventually innovative way.

To describe the process implied by the black box, two classes of functions can be distinguished:

*S.F. = state functions:* A representation of the relevant information the system has collected in all the situations it has ever been in. In our case, the individual's memory unit can be seen as the receptacle that contains the state functions, i.e. has stored a symbolization of the totality of experiential data.

*D.F. = decisional functions.* These can only be distinguished analytically from the state functions. Since the two are in reality completely interwoven, the dividing line in the model should be conceived as a membrane rather than a wall. The decisional functions form the steering part of the system; they are more immediately output-oriented than input-oriented, and are the result of an abstraction process, by means of which the relatively uncoded experiential data<sup>9</sup> develop into:

1. An *environmental mapping*, which is used to deal with the environment, and therefore should contain an adequate symbolic representation of that environment: i.e. should depict the *objects* in the environment, and their *interrelations* via their *attributes*, as well as the position of the system in this environment;
2. A *set of values*, operationalized as the sets of goals one strives for at a certain moment;<sup>10</sup>
3. A set of *procedural rules*, indicating which outputs (actions or reactions) to give in a certain situation on the basis of one's environmental mapping and value hierarchy.

These three main classes of decisional functions at any given moment can be considered the result of a constant and cumulative restructuring and retrospective recoding of information stored in the state functions (= past experience) as a consequence of having to react to new inputs, and with the result that the system itself constantly manufactures new information.

*E = environment:* Everything outside the system. This definition, encompass-

sing the entire universe, is clearly a bit wide. Therefore it may be more practical to speak of the relevant environment, i.e. that part or aspect of the total environment the system is in interaction with at any given moment, or at least either receives input from, or gives output to.

The environment precedes the individual. Certainly at birth, but also later, the individual's environment is to some extent an unchangeable given. Unfortunately, one can choose neither one's parents, nor one's language, culture or social system. These limiting environmental factors evidently pose constraints – however flexible the language, however responsive the social system – on the possibilities for alienation reduction and individual self-realization. A normative conception of alienation should reckon with these inevitable limits.

### 3. Forms of alienation and general systems theory

#### 3.1 Introduction

Seeman, in a pioneering article<sup>11</sup>, distinguished five dimensions of alienation:

- *powerlessness*: 'the expectancy or probability held by the individual that his own behavior cannot determine the occurrence of the outcomes, or reinforcements, he seeks';
- *meaninglessness*: 'a low expectancy that satisfactory predictions about future outcomes of behavior can be made';
- *normlessness*: 'a high expectancy that socially unapproved behaviors are required to achieve given goals';
- *social isolation*: 'assigning low reward value to goals or beliefs that are typically highly valued in the given society';
- *self-estrangement*: 'the degree of dependence of the given behavior upon anticipated future rewards, i.e. upon rewards that lie outside the activity itself'.

In these definitions, Seeman explicitly bases himself upon *subjective expectations* of individuals. The Marxists among his critics take him to task for this, arguing that he helps to further establishment sociology by concentrating on subjective states of individuals (e.g. their expectancies of being powerless) without judging their reality content, and thus takes attention away from the meso- and macro-societal structures that cause these feelings (e.g. actual conditions of powerlessness in the work place, and in the capitalist system generally).

Seeman has indeed concentrated on measuring subjective states of individuals, and has not investigated their eventual environmental determinants, although he evidently does not deny that the *causes* of alienation lie elsewhere, outside the individual; either in the environment, or, as is more probable, in the individual-environment relation.<sup>12</sup> But he does well to insist on alienation itself as a subjective state of an individual, to be distinguished sharply from *alienating*<sup>13</sup> social structures. Once having made this distinction, it is then a matter of argument whether one should concentrate primarily on alienation itself (Seeman), or on alienating conditions in the social structure (Marxists), on the phenomenon itself, or on its causes.<sup>14</sup>

It is interesting to note, in view of Marxist criticism of Seeman, that Marx himself distinguished similar dimensions of alienation as Seeman<sup>15</sup>; the worker is rendered *powerless* by having no say over his products or the means of production; the whole process of production becomes *meaningless* to him, because he cannot obtain a clear picture of it and see its wider implications; being forced by the capitalist system to see himself, his body and his capacities as marketable goods is conducive to *self-estrangement*, which in turn leads to *social isolation*: the worker's forced self-objectification leads him to see also his fellow men as objects, with whom no personal relationship exists. Marx's concern with *normlessness*, finally, is evident throughout his work, in his criticism of the dehumanizing effects of the capitalist system, although admittedly Seeman based his normlessness dimension on Merton's reformulation of Durkheim's concept.

Another criticism levelled against Seeman, concerning his alleged arbitrariness in distinguishing five – and not three, or eight – alienation dimensions, can be invalidated by showing the close correspondence between his five dimensions and the five components of our model: i.e. between powerlessness and information processing problems primarily located in the output of the system, and likewise between meaninglessness and input, normlessness and decisional variables, social isolation and a breakdown of the interaction with the environment, and finally between self-estrangement and the situational variables.

Of course, it is difficult to find a one-to-one correspondence, since both the alienation dimensions and the components of the systems model are each closely interrelated. Disturbances anywhere in the model, e.g. in input, are immediately followed by disturbances all along the line: state functions, decisional functions, output, and (via environment) input again. One may therefore even observe that an input-disturbance 'feeds forward' to create a (new or intensified) input-disturbance. The same holds true for the alienation



dimensions: each one is unthinkable without the four others being present to some degree. Seeman also implies this circular causality in his definitions, as when he defines meaningfulness as a low expectancy (Decisional Functions) that satisfactory predictions (Decisional Functions) about future outcomes (Inputs) of behavior (Outputs) can be made.

Bearing this reservation in mind, we may now proceed to investigate in more detail the postulated correspondence between alienation dimensions and model components. It should be clear, that we only defend the position that, for example, powerlessness should be *primarily* located in the output, not that it should be done *exclusively* so; powerlessness is often caused by the environment via input disturbances of the individual, who then has trouble storing the information received, and is immobilized because of cognitive and emotional conflict within his decisional variables.

### 3.2 Powerlessness – Output

Power is not an attribute of a *person*, but of a *relationship*; it is often defined as the capability to limit the number or effectiveness of someone else's alternatives to act or react. A has power over B if and only if B does something A wants him to do, or refrains from doing something A does not want him to do. In both cases A limits B's alternative outputs. In case A stands for a social structure instead of a person, there is evidently no volition on the part of A, but the output restrictions on B can be effective all the same (e.g. Etzioni's non-responsive social systems).

The main characteristic of powerlessness is that output alternatives are diminished; in Seeman's definition, though it pertains to the perception or expectation of powerlessness rather than to the phenomenon itself,<sup>16</sup> even extremely so. Whatever behavior alternative the individual decides upon, it is perceived correctly or incorrectly to be utterly ineffectual in bringing about the reinforcements he seeks. This perceived reduction of output alternatives is not necessarily caused, however, by an outside agent. The system itself, also, may inhibit its own options for action or reaction; in that case, powerlessness is the result of disturbances within the system, generally resulting from 'incorrect' perception.

Two different examples can be given here:

- 'Marxist' powerlessness, at least in its first stages, where the worker cannot undertake effective action to end an objectively existing state of powerlessness, because he incorrectly identifies its sources in the social structure: he

swallows the mystifications offered by the system and cannot attack the real problem as long as he is hampered by his false consciousness (inadequate environmental mapping) and does not develop any real insight in his situation.<sup>17</sup>

- ‘Psychiatric’ powerlessness,<sup>18</sup> where alienation has been defined as the inability to say ‘no’ to the expectations of others, i.e. as a lack of autonomy one has been programmed into by abnormally strict and demanding parents, whose norms live on long after they have removed themselves from the scene. In this case, unlike the first example, the powerlessness is usually imagined, i.e. not caused (anymore) by external reality.

### 3.3 Meaninglessness – Input

Meaning is primarily assigned to incoming potential information by coding it, i.e. by giving it a specific place in the network of information stored already. One tends to forget that signals from the environment have no meaning by themselves; they are given meaning by the system.<sup>19</sup> Meaninglessness is therefore the result of the (personality) system’s subjectively felt inability to assign meaning to new inputs – ‘future outcomes of behavior’ in Seeman’s definition – because they are not recognized as combinations or transformations of existing codes (categories), i.e. cannot be tacked on to some aspect of the pre-existent environmental mapping. When something is completely new, it cannot be recognized.

Inputs usually have information potential; they become information only when they can be coded by the system. Inputs that cannot be related to the system’s codes provide no information, as is illustrated by the well-known example of the Stone Age man, who – confronted with his own picture – does not recognize himself. This coding process takes place on at least two levels:

1. ‘What information, if any, does this input contain?’ (dependent on the state of the system, especially the degree of differentiation of its codes) and:
2. ‘how reliable is this information?’ (dependent on reality testing, by interaction with the environment: obtaining intersubjective agreement, or personal verification). *Information is always transformation: it brings about a change, however small, in the system’s decisional variables – his image of the world around him, his goals and values, his procedural rules – and adds to them, making them a bit more complex.*

If the environment is too simple and stable, it yields little information, and the individual is understimulated.<sup>20</sup> If it becomes too complex and conse-

quently is likely to be in constant change, it generally has a vast information potential. This potential remains largely untapped, however, because often the differentiation of the system's codes cannot keep up with the growing complexity of the environment. Due to this increasing 'complexity differential' there is simply no place to adequately store the new inputs. They supposedly have some meaning, but it cannot be grasped, at least not fully. The wealth of potential information is lost, and oversimplification results, with its attendant increase in powerlessness due to unrealistic environmental mapping.

This is especially true when the inputs concerned are not reactions to former outputs of the system itself. This is the case when the individual is influenced by institutions and social processes that lie beyond his horizon, but nevertheless impinge on his personal life. In primary group interaction, this one-way influence from the environment upon the system is virtually absent, but in complex modern societies it becomes progressively more relevant. The system is unable to reciprocate: only inputs are received, but generally no outputs can be given (contacts with uninfluencable bureaucracies, being caught up in political or economic upheavals, confrontation with unverifiable specialized knowledge).

As a result, 'reality testing'<sup>21</sup> of conclusions based on this input is impossible. This of course enhances the difficulties inherent in 'placing' already very complex inputs, and thereby increases meaninglessness. The more the complexity of the system's codes approaches the degree of complexity of the environment, the more chances for meaningless inputs are reduced.<sup>22</sup> Every simple system in a relatively more complex environment is subject to heavy pressure to differentiate its codes. If this process of differentiation is obstructed for some reason – often precisely by misdirected efforts to assign meaning to a bewildering reality: stereotyping, prejudice, simplifying ideologies, reductionist science, etc. – meaninglessness ensues.

### **3.4 Normlessness – Decisional functions**

Norms can be conceived as transformation rules for changing inputs into outputs; they are guidelines for action or reaction under certain specified conditions. Norms have mainly a behavior-steering function, and thus should evidently be localized in the steering part of the system, the decisional variables: especially in the value hierarchy, but also in the procedural rules and even in the environment mapping, where norms are used implicitly all

the time. Normlessness can therefore refer to steering problems in either one of the three parts of the decisional variables.

Seeman limits normlessness to a very specific transformation problem: the expectancy that socially unapproved (=input) behaviors (=output) are required to achieve given goals (= decisional functions). Here, inputs from a certain part of the environment (the norms prevailing in one's membership or reference groups) are at odds with the system's output (the behavior resulting from the decision to strive towards one's goals, using means that are defined as illegal by the environment).

In the alienation literature, however, many other types of normlessness are distinguished, including Durkheimian anomie situations, and different kinds of (internalized) norm conflict.

A few desiderata may be spelled out, if information processing problems in the decisional functions are to be prevented:

1. Norms should have a certain *minimal flexibility*. This implies, inter al.:

- a. The transformation rules should be such that one input can be coupled to different outputs and not to one only, i.e. that varied responses *can* be given to the same situation.<sup>23</sup> If the input completely determined the output, there would be no degrees of freedom, and the human being would be no different from a trivial machine. In slightly more sophisticated machines – and some not so sophisticated people – the output is determined not only by the input, but also by the state of the system at the time of the input.

In reasonably mature human beings (i.e. provided they are relatively 'gamefree'<sup>24</sup>), the output is determined not only by the input plus the present state of the system, but also by (a symbolization of) any one of the states the system has ever been in before, which ideally makes for an unlimited number of output options.

- b. Norms (environment mapping, value hierarchy, and procedural rules) should reflect changes in the environment. They should not change too slowly (which makes for individually dysfunctional or socially unacceptable – Seeman! – norms, unfit for processing new inputs), nor too fast (enough incoming variance should be analyzed to make sure the environmental change was not accidental and is there to stay).

2. Furthermore, the individual's norms (and not necessarily the norms in his environment) *at a given moment* should be *reasonably consistent*, or at least not sharply contradictory; otherwise, new inputs would result in the (personality) system being 'on the horns of a dilemma', with a resulting output inhibition or output fluctuation. And this is clearly an undesirable situation if one accepts the meta-norm that 'the show must go on', i.e. that information-

processing must continue, and that the individual should not regress to a semi-closed system state.

This can be illustrated with two basic norms pertaining to goal choice in the environment. In every individual, goal choice is regulated minimally by two normative continua: a 'biological' one from birth onward (pleasant – unpleasant), and a 'psychological' one learned later (safe – unsafe). Now, if the individual has been programmed to equate pleasant with unsafe and unpleasant with safe – instead of the other way round, as would be 'normal' – oscillating behavior will result. Assuming for the sake of argument the primacy of the biological axis, the process starts with selecting a pleasant goal and striving towards it. Subsequently this is given up, because it is threatening. To play it safe, literally, a less pleasant goal is selected next, but after a while anxiety decreases and this seems a poor way of spending one's time, so a pleasant goal is chosen again and the cycle recommences, iterating endlessly as long as the program remains unchanged.

This type of norm conflict can be observed especially in 'psychiatric' alienation, but also in the 'Marxist' variety, where the programming is accomplished by the capitalist system instead of by double-binding parents. No norm conflict ensues, of course, if safe – pleasant and unsafe – unpleasant are equated. The first coupling presents no problems; the second one is admittedly a bad one, but at least it has the merit of being unambiguous and one tries to get out of it wholeheartedly.

### 3.5 Social isolation – Breakdown of interaction with the environment

The 'social' in social isolation explicitly refers to the environment, as opposed to the self-isolation that is prevalent in the descriptions of self-estrangement. Social isolation should therefore be defined as a (relative) breakdown of the system's interaction with its environment: as inhibition of both inputs and outputs.<sup>25</sup>

The differences from powerlessness – defined as output inhibition – should be clear: here, the problem is not necessarily imagined or caused by (some person, institution, or structure in) the environment, but the isolation may be *consciously sought*.<sup>26</sup> Moreover, it pertains to *inputs* as well as outputs. Finally, it points to an *absence* of in- and outputs rather than to a disturbance in either one of them.

Cases of extreme social isolation are rare: when the concept is used in the

alienation literature, it usually refers to individuals who are isolated in *some* ways from *part* of their environment. Seeman, for example, views social isolation mainly as isolation from the goals or beliefs of one's culture. As Schacht points out, the term 'social' is very ambiguous and can mean both 'interpersonal' and 'societal'. Social isolation can therefore be construed both as an absence of positive interpersonal relationships and as a dissociation from the norms – or values, or culture – of one's society.<sup>27</sup>

When extreme social isolation is induced artificially, as in laboratory experiments with sensory deprivation, the subject generally starts hallucinating within a few days; lacking inputs, not being allowed to give outputs, and apparently needing a minimum threshold of stimulation, he manufactures his own 'information'. These experiments imply that information stimulation is essential to man's functioning: normal functioning breaks down when the information exchange with the environment is interrupted for some time.

### 3.6 Self-estrangement – State functions

Self-estrangement denotes a lack of internal communication within the system. It is the alienation dimension studied especially by psychiatry and psychoanalysis, where references are made frequently to phenomena like repression, loss of contact with the 'real self', etc. Self-estrangement takes place on a more or less unconscious level, as opposed to the different kinds of normlessness: they sometimes also imply a lack of internal communication, but then on a more conscious level, within the decisional variables.<sup>28</sup>

In systems terminology, self-estrangement means that certain parts of (relatively uncoded, 'raw') experience are inaccessibly stored, in the state functions. Generally this happens early in life, as a defence against a traumatizing chain of events. That only *important* experiences are concerned is self-evident (otherwise there would be no need to repress them); and that they are indeed *stored* – although inaccessibly – and not simply erased, is proven on the analyst's couch.

Precisely because these repressed inputs are stored in *isolation*, screened off from the totality of information, they don't interact with the remainder of (non-repressed) experience to form the decisional variables. Essentially, two or more information-processing subsystems coexist independently. As a result, the 'superstructure' of environmental mapping, values and procedural rules also becomes alienated. This gives rise to what can be described in Marxist terms as false consciousness (to the extent that inadequate environ-

mental mapping is concerned), or in psychiatric terms as being out of touch with one's 'real self' (insofar as alienated goals and values are stressed). One has permitted oneself to forget what one really wants out of life – because it was considered unrealizable anyhow, or emotionally threatening, or supposedly necessitated too large an expenditure of energy and frustration tolerance. A behavioral consequence is that one keeps oneself busy striving towards goals that are intermediate (e.g. money, status) but offer no inherent satisfaction (Seeman's 'dependence of the given behavior upon rewards that lie outside the activity itself').

From a systems point of view, it is interesting to note that repression usually takes place quite early in life; later, defence functions are generally taken over by other mechanisms like stereotyping, denial, projection, etc. The latter are probably isomorphic in the sense that they all prevent unwanted information from entering the system and form a kind of 'input filter' that is operated from within. The very existence of such a filter presupposes the existence of a program, against which the positive or negative values of inputs are judged. This is formed in the course of life, when the decisional functions (the program) come into being and are further differentiated as a result of 'conclusions' drawn from concrete experience (the state functions). Exactly because such a program, and the accompanying filters, are lacking in the early stages of life, repression is different (from a systems viewpoint) from the other defence mechanisms: it is a 'second line of defence', operating against unwanted information that has *already* entered the system.

#### **4. Advantages and further applications of the systems approach**

Having amplified above how each of the five Seeman-dimensions can be considered to correspond with a component of the systems model,<sup>29</sup> we find that the advantages of the systems approach have become more evident:

If one accepts the model as giving a *complete* description of the different phases of information exchange between a system and its environment – complete, of course, on a very high level of abstraction<sup>30</sup> – it follows that Seeman's five dimensions of alienation are indeed the only five dimensions that can be distinguished *on this level*. The only part of our model not corresponding with a Seeman-dimension is the *environment*. However, since alienation was defined as an information processing disturbance of a *system*

(i.e. as an individual phenomenon), although a system in interaction with its environment, it will be clear that the environment manifests itself to the system only via inputs. Only that part of reality can be observed that presents itself to our senses or input-channels, the observation being always coloured moreover by the state of the system and the way the system's decisional functions are programmed, or have programmed themselves.

General Systems Theory provides us with a consequent conceptual basis for deciding whether something is a form of alienation or not:

- 'Naked' powerlessness for example, occurs when the individual is fully aware of his situation, has tried out in vain all possibilities to do something about it, and moreover correctly identifies its causes without taking recourse to mystifications or repressions. Yet, this does not entail a state of alienation, but at worst one of fatalism. There is no information processing disturbance here: the situation is definitely not pleasant, but not every unpleasant state should be considered alienated. It becomes an alienating situation only, when one stops being fatalistic about it and no longer accepts it as inevitable, because it is at odds with a less powerless state the individual continues to see as possible, in spite of being unable to bring it about in the near future.
- On the other hand, it clearly *is* a form of alienation, although usually not distinguished as such in the literature, when there is no inhibition of output alternatives whatsoever but, on the contrary, an overload of possibilities one dimly registers, but cannot choose from. In this case, the information received from the environment is too complex relative to the simplicity of the individual's codes: evidently an information processing problem, whether manifested by Buridan's ass hesitating between his two bales of hay, or by modern man.

A further differentiation of the systems model may also provide criteria for a relevant subdivision of any one of the main forms of alienation. When, for example, social isolation is defined as a *breakdown of interaction* with the *environment*, one may ask: what kinds of breakdown, of interaction, and of environment can be distinguished in a way that is appropriate for discriminating different kinds of social isolation? The breakdown can be total or partial, chosen by the individual or imposed; the interaction may have been mainly adaptive or mainly manipulative, and it may pertain to smaller or larger segments of the total environment. Schacht<sup>31</sup> makes a relevant distinction here between majority culture (Nettler, Middleton), fundamental societal values (Keniston, Merton, Parsons), societal behavioral norms (Merton, Lowry, Putney and Middleton) and interpersonal relations (Hajda, Aiken and Hage).



Different theoretical approaches important to alienation theory could be compared and eventually combined – without being reductionist or denying theoretical pluralism – by translating them into systems terminology: e.g. mass society theory, Festinger's cognitive dissonance theory and Heider's balance theory, behaviorist learning theory, the Internal-External Locus of Control approach, Durkheimian anomie theory, Marxist and psychoanalytic frames of reference, etc. A systematic comparison of these theories, which might yield illuminating and unexpected results, becomes possible only after having translated them into a common conceptual framework.

The systems approach can be applied not only to the *forms or dimensions* of alienation, but can also improve insight into its *causes or origins*. Without going into the specific causes postulated by different authors, one may conclude that they tend to fall into three main categories:

- a. *Alienation is inherent in human life*, as an ontological given; a position taken mainly by theology and philosophy, including some Marxist (Berger and Luckmann) and existentialist (Heidegger) philosophers. Consequences of this approach: everyone is inevitably alienated – from birth onwards – as a result of the 'condition humaine'; reduction of alienation is impossible, unless transcendental goals are introduced to provide meaning to an otherwise meaningless existence; there is no specific cause of alienation.
- b. *Alienation is produced in early life*; a position mainly defended by psychiatry and psychoanalysis. Consequences: only those undergoing alienating influences in their formative years<sup>32</sup> – almost by definition from *primary group members*, since one does not know any others at that age – are alienated; alienation starts in the first few years of life and becomes an integral part of one's program; reduction of alienation is possible via several kinds of psychotherapy that aim at changing this program; alienation is caused by 'mentally unhealthy' interaction patterns with primary group members (especially parents) that become conditioned and later prove hard to get rid of.
- c. *Alienation is produced (sooner or later) by the individual's social environment*; a viewpoint especially propounded by sociology, criminology, political science, Marxism. Consequences: only those persons undergoing alienating influences from or via wider social structures (from secondary groups to society as a whole) are alienated. This alienation, generally produced by groups or processes in the individual's macro-environment, starts later in life – when one comes into contact with these groups or processes, e.g. at working or voting age.<sup>33</sup> It can be reduced only by

changing the alienating social structure concerned, has a large number of postulated causes, centering mainly around powerlessness and meaninglessness. When society as a whole is considered alienating, and not just certain parts of it, then of course everyone is alienated, but unlike the alienation inherent in human life this alienation is not inevitable.

In systems terminology one might say, that the first view of the causes of alienation ('theological alienation') is based on the drawbacks of *any information processing* as such, irrespective of whether specific disturbances exist or not. Having to cope with contradictory information is inevitable, no matter how well it is done. Similarly, having to choose between different output alternatives and giving up the non-realized possibilities is equally inevitable, and independent of one's aptitude at making fast and well-founded decisions.

The second view ('psychiatric' alienation) is centered mainly around the *programming* of the system: one's 'basic' program is more difficult to change than later developed 'subroutines' precisely because these come about in part as a result of this basic program which functions as a comparison base. The basic program lacks such a base, and once established it is very difficult to change through later inputs, because these are interpreted in terms of the (wrong) program.

The third view ('sociological' alienation) is based on the possible *disturbances anywhere in the information exchange cycle* with the environment. It includes of course normlessness, in the sense of a lack of adaptability of the (basic) program, which is viewed here, however, as a *reprogramming* problem rather than as a programming one: e.g. accelerated social change, which makes a revision of the old program mandatory.

Whether one tries to locate the cause of alienation in the first, second or third area is of course completely independent of Seeman's classification: 'theological', 'psychiatric' and 'sociological' alienation can each manifest every one of the five Seeman-dimensions. The interesting point here is, that General Systems Theory can be used to provide a theoretical basis for differentiating not only between the *dimensions* of alienation, but also between its postulated *causes*. These can be seen respectively as limitations of life viewed as information processing, constraints imposed on information processing by the system's program, and constraints imposed by the system's environment.

## 5. GST and modern forms of alienation

### 5.1 Introduction

The systems approach can also be used to elucidate some of the typically modern forms of alienation. These modern forms are often not referred to as alienation in the literature. They are described under many different names: information overload, overchoice, lack of self-realization, etc. It seems justifiable, however, to consider them as modern forms of alienation, since they all refer to information processing problems of individuals.

Why modern forms? First of all, Seeman's alienation dimensions do not refer exclusively, or even especially, to modern situations; they are not that much time-bound or culture-dependent. Even in antiquity, man experienced powerlessness, or meaninglessness, or any of the other dimensions. The same goes for the causal approaches to alienation. Theological alienation is as old as human life; it was there before man conceived of a God and may very well have been the prime motivating force in concluding to his existence (see Ernest Becker's last book: 'The denial of death'<sup>34</sup>). Psychiatric alienation exists as long as there have been neuroticizing childhood relations, i.e. long before psychiatry discovered them. And sociological alienation has been there since man's human environment has exerted conflicting pressures on him.

What distinguished these forms of alienation from the modern ones, however, is that the latter are indeed modern because they are the result of a *recently accelerating complexity differential* between the individual and his environment. The human infant remains relatively unchanged through time; but the adult now lives in a much more complex environment than any of his predecessors, including his own parents – and the road to adulthood has consequently become that much longer, with all its attendant stresses and pitfalls. Of course, this increased complexity refers mainly to the man-made environment, to the feedbacks of both increased technological control over the non-human environment and to the increased complexity and interdependence of human organization forms themselves.

We have already pointed to two interrelated theoretical conceptualizations that are of interest in this respect:

1. *W. Ross Ashby's Law of Requisite Variety*, which states that only internal variety within the system itself can force down the variety due to the system's environment: the system's codes must be as highly differentiated as the (potentially system-relevant) variety obtaining in the environment, if the

system is to perceive this variety at all, let alone make fully sense of it and be able to steer it. One cannot perceive something one cannot 'place'. Information that is overly complex relative to the degree of differentiation of the individual's codes – influenced by his educational level, I.Q., level of emotional development, previous experiences, etc. – goes in one ear and out the other, without registering.

2. Niklas Luhmann's concepts of *Eigenkomplexität* (internal complexity) vs. *Weltkomplexität* (world complexity, or: environmental complexity). Luhmann envisages reduction of environmental complexity as one of the main functions of systems; this reduction is accomplished by the system's gradually building up its own internal complexity. Once provided with a set of codes to reduce environmental complexity – i.e. to assign infinite outer variety to a finite set of categories – the system can then employ these codes to generate complexity for its environment, by processes of combination and permutation. In this way, a potentially infinite number of outputs can be given.

We should be very clear here, that we are speaking about *objectively* – or at least: intersubjectively – increasing environmental complexity, to be distinguished from the individual's increasingly complex *image* of his environment, which is just the consequence of his growing older and having had more experience. Such a realization that everything is not as clear-cut as it once seemed to be is simply the result of socialization into an already pre-existent environmental complexity.

Man has always been trying to reduce environmental complexity by building up internal complexity<sup>35</sup>; this is nothing new. His environmental mapping becomes more differentiated over the years, his state functions contain more first-hand experiences, his decisional functions more complicated abstractions derived from them by ongoing processes of combination, permutation, and generalization. Therefore, if the individual's development is not thwarted for one reason or another, and he remains in open interaction with his environment, his intellectual and emotional complexity – and his resulting ability to handle complex intellectual and emotional situations – increase over the years.

This takes place in two closely related ways:

- A process of 'horizon enlargement', or differentiation of the environmental mapping: one gradually learns to register ever more complex situations in one's environment, as one learns to develop the appropriate codes. How this happens exactly, whether through long chains of hierarchically ordered reinforcers or otherwise, is a problem we cannot go into here.

- One also becomes more complex oneself: one gains more experiences, more memories from different times, places, people, situations. These interact all the time, and lead to a continuous retrospective recoding of stored information. One has, in other words, an increasingly large ‘data base’ in the state functions from which to make new combinations and permutations: a necessary, but not yet sufficient precondition for creativity.

It should be noted that both this growth of inner complexity and the concomitantly growing realization of environmental complexity – which was already there when the individual was younger, but could not yet register it fully – are relatively independent of the *objective complexity* of the environment, and certainly of its rate of growth.

The important point here is that the complexity *differential* between the individual and his environment has increased tremendously in the recent past and is still accelerating. What we have witnessed in the last few decades is an exponential growth of environmental complexity, the like of which has never before occurred in the history of mankind. The ‘knowledge explosion’ and the ‘technology explosion’, mutually feeding upon one another, constantly manufacture novelty, both quantitatively and qualitatively. The high percentage of novelty in modern human environments may disturb normal learning processes – one learns by encountering situations that are preponderantly familiar and contain only a small dose of novelty, that can thus be assimilated – and this gives rise to modern forms of alienation.

Like Seeman’s alienation dimensions, these modern forms of alienation can also be equated with the different elements of our model. But while in our conceptualization of Seeman’s dimensions the system and its environment were more or less equal partners, exchanging information and thereby influencing one another mutually, the modern alienation forms are characterized by such an increase in the complexity of the environment, that consequently the environment can produce more variety than the individual can ever hope to reduce in a lifetime, while it moreover often exerts a one-way influence upon the individual, who cannot find the ways to reciprocate and respond adequately.

Not only individuals can be viewed as systems. Man-made systems of human organization are indeed systems too, and they tend to follow their own laws, going with their own emergent level of complexity, and be hardly amenable to steering efforts of individuals, even those at the top. The powerlessness this engenders is quite different from the still existing powerlessness of the exploited laborer of Marxist theory, which is characterized by output

inhibition through outside forces rather than by unclarity about the inter-relations between the objects in the environment.

Now, what are the specific consequences when a system is confronted with an environment much more complex than itself?

## 5.2 The effects of environmental overcomplexity on the system's input

Starting our model cycle with the *input*, we can first of all reconceptualize alienation as a *scanning and selection problem*, as an inability to make an adequate selection from the multitude of inputs one is bombarded with daily. Only near-random selection seems possible – even when one is actively searching in the environment for specific information – since the complexity of the inputs offered is so overwhelming compared with the relative simplicity of the individual's codes, that firm selection criteria are extremely hard to develop in this 'bear market'. At best, one realizes that the environment *is* complex, but one is unable to pinpoint and analyze this complexity.

With the 'normal' forms of meaninglessness, the individual could at least console himself with the assumption that there might be some meaning to it all, but that only *he* could not grasp it because of momentarily insufficient or contradictory information. He might think that with a bit of hard work he would come to understand things presently beyond his comprehension, e.g. by 'reality testing'. As stated before, this implies: producing a new hypothesis by reshuffling 'old' information, giving outputs on the basis of it, ascertaining whether the resulting environmental feedback (the individual's input) conforms to predictions, and developing another hypothesis when this is not the case – and so on, in an iterative process during which the individual builds up his inner complexity by developing the appropriate categories to deal with outside reality and assign meaning to it.

It should be restated at this point, that we oversimplified when equating meaninglessness, like the other four dimensions, with a certain part of our model. Each dimension can only to a certain extent be considered isomorphic with one model-element alone. The model is a circular one, and likewise there is a circular causality in Seeman's dimensions. A disturbance in one element or dimension makes its consequences felt in the others. Viewed in this light, meaning can now be redefined as the high probability of a certain environmental response on a certain specific output of the system, which in its turn is given on the basis of its decisional functions (its goals, its perception of

outside reality, its perception of the ways to reach these goals), which again are the result of previous environmental inputs interacting with the system's codes.

It is understandable therefore, that in a highly complex environment, where especially the 'environment section' of this circular causal chain has become so stretched out that it may be subject to unexpected 'quantum jumps', input-unpredictability increases. As a result, the system is unable to screen itself off sufficiently from undesired inputs: it does not know beforehand which inputs will increase its cognitive dissonance, and even when it does it cannot fathom whether this is indeed undesirable in the long run. Undesired inputs evidently increase with the complexity of the environment: the individual has more interaction partners, which makes it more likely that conflicting environmental demands have to be reconciled. The situation here is totally different from the case of psychiatric alienation, where more or less 'effective' defense mechanisms can be developed because it is easier to recognize concretely threatening or anxiety-provoking situations in the middle of non-threatening ones, than to pinpoint a highly abstract notion like complexity in the middle of non-complexity. If one feels – or is – unable to reduce environmental complexity, and therewith cannot assign meaning to it, one has to build up adequate defense mechanisms for denying it. Since the vast increase in complexity differential between individual and society is a relatively recent phenomenon, these mechanisms hardly exist yet. It still remains to be seen whether they can be developed without too high a cost for the individual: an increased sense of meaninglessness, reinforced by a reduced possibility for reality-testing as a consequence of increased non-participation.

Of course, increased input-complexity and input-unpredictability have their advantages as well as their drawbacks. Here we have to differentiate between the situation, where the individual has to make a *selection* from the inputs offered by the environment, and the situation where the individual has to actively *scan* the environment for specific inputs, and must stimulate it to elicit these inputs by giving specific and well-directed outputs. If one is actively searching for specific inputs, one perhaps has to scan a lot more in a complex environment – which can be very tiring – but on the other hand one has a better chance to find exactly what one wants than in a more simple environment, that offers less diversity. On the passive side, however, as far as selection of inputs offered is concerned, one has to develop screening mechanisms in order not to become overburdened with system-irrelevant inputs: this pressurizes the individual to develop a well-defined goal hierarchy, if he is

not to spend most of his life reacting to inputs that are relatively meaningless to him.

### 5.3 The effects of environmental overcomplexity on the system's state functions

In the *state functions* the information overload described above results in alienation as an *assimilation problem*. Experiences can only be assimilated if they can be stored; and they are always stored, not as 'the real thing', but as symbolizations of what actually happened. Therefore, the system must have an adequate set of these symbols or codes at its disposal to reduce each experience, each instance of concrete environmental variety, to a combination of these codes. One cannot retain an image of, say, a blue sky, unless one has at least developed the symbols 'blue' and 'sky' – including the permissible variability range within each of these codes. Even more of these symbols are involved in remembering a specific blue sky. If this were not the case, one would not be able to differentiate in one's memory between the various blue skies one had seen. One remembers a particular blue sky by associating with more codes than just 'blue' and 'sky': time, place, companion, and general mood at that moment are a few obvious possibilities. These factors all lend a certain emotional color to one's memory of just that particular blue sky. And that memory can be reached later on only through one of the codes involved.

If concrete experiences can only partially be coded, they can only partially be assimilated, and can be used only to a limited extent as a basis for later action. Now, the more the environment generates complexity, the more chance it also has to generate novelty. Thus, in an extremely complex environment, the individual is continually driven to enlarge his set of codes; not only in the sense that through time he has to develop new codes (concepts) to deal with outer reality, but also in the sense that the more complex a specific environmental situation at a certain moment, the more a *combination* of codes is needed to store it adequately. It is conceivable that to really store a concrete experience in such a way that one may learn from it (i.e. that it brings about a change in the environmental mapping) and can retrieve it whenever necessary on future occasions, it indeed has to be stored in a great many different codes *simultaneously*. Since one can only remember an experience via one or more of the codes in which it is stored, a large number of simultaneous codings diminishes the 'random access time' of that particular memory and increases the chances it will be recalled later.



A highly complex environment therefore generates stress in the individual's state functions: unless he is constantly enlarging his number of codes, and moreover learns to store most of his experiences in an ever more intricate combination of these codes, he will not be able to truly assimilate new experiences, let alone recall them on future occasions when it is functional to do so. This is not a case of repression, as it would be in psychiatric alienation: it is not the result of a defense mechanism, that insulates threatening – but extremely well registered – experiences in such a way, that they cannot be consciously remembered later on. Here, the problem is that the experiences were never adequately registered in the first place.

However, both these alienation forms pertaining to the state functions – the result of psychiatrically caused repressions, resp. the inability to assimilate too much novelty and complexity – do have a certain isomorphism. Both refer to experiences that the individual actually encountered as inputs in his past, but cannot fully reach later due to inadequate coding. In both cases these experiences don't form learning situations, yet both are vaguely remembered and give the individual the weird and somewhat schizophrenic feeling, that he has another life tucked away somewhere, far away from his conscious daily living, which somehow is also his, but which he yet cannot reach and truly call his own – a feeling commonly described as self-estrangement, and in our vision the consequence of experiences being coded in such a way (for whatever reason) that they don't interact with the remainder of experience, thus leading to the formation of 'truncated' decisional functions: i.e. environmental mapping, values and procedural rules that are based on only a part of one's total experience – either denying or simply not using the remainder – and that therefore can be described in Marxist terminology as examples of false consciousness, and in psychiatric terminology as rationalizations.

#### **5.4 The effects of environmental overcomplexity on the system's decisional functions**

In the *decisional functions* Seeman's normlessness dimension of alienation can be reconceptualized in different ways to account for the effect of the increased complexity differential between man and his environment.

a. Especially in the *environmental mapping*, alienation can be viewed as a *flexibility problem*. Changes in the environment often happen so rapidly and are so far-reaching and essential, that no matter how efficient one's program,

it is rarely sufficient to cope with complexity and has to be overhauled quite frequently. This results in alienation as a flexibility problem, a function both of the speed with which one can change one's program in response to a changed environment, and of the need to do so, i.e. the degree to which one can bear inconsistencies without feeling uncomfortable or threatened. Our 'either-or' way of categorization, derived from simpler times and civilizations, is utterly inadequate to contain the increased complexity of internal codes necessitated by growing environmental complexity. A more flexible 'and-and' way of categorizing is necessary, which would increase tolerance of ambiguity to the higher levels needed to maintain oneself in a complex environment.

In such an environment, the environmental mapping contains more symbolizations of different objects than in a simpler one; the number of interrelations between these objects (through their attributes) is increased even more, and the same holds true for the possible interrelations between these objects and the self-image of the individual. The environmental mapping, that can be seen as the mirror of outside reality in its relation to the individual, therefore becomes an extremely subtle and differentiated structure, which moreover is in constant need of revision, since the ceaseless bombardment with new information makes a continual updating of the existing information network a precondition for flexible adaptation, if not survival.

A different way to consider alienation within the *environmental mapping* is to see it as an *identification problem*, a disturbance in a socialization process, that should – if it were adapted to present-day complexity – involve a process of ever widening identifications. Whether he wants it or not, the average individual now has more complex relations with more objects in his environment than ever before; an adequate environmental mapping has to represent these relations symbolically as identifications. Evidently, this is often not the case. One of the reasons why the concept of alienation enjoys so much attention may very well be that the average individual cannot cope with increased environmental complexity, and therefore regresses at a certain stage in his development to a kind of semi-closed system state, where fully open interaction with the environment is lacking, and reality is made to measure by resorting to oversimplifications. Viewed from this perspective, there is more alienation now than before, because higher demands must be fulfilled by the individual before he can be termed unalienated.

b. In the *value hierarchy*, where the goals one strives for are defined, and in the *procedural rules*, where ways to reach these goals are selected on the

basis of one's (hopefully realistic) environmental mapping, alienation can be viewed as an *overchoice problem*: not as a lack of freedom, as in most of its classical forms, but on the contrary as a too suddenly enlarged freedom one is therefore unable to use. Insofar as the information overload described before is pertinent to alternatives for action or reaction that have to be evaluated, it results in an overchoice problem for the decisional functions: the capacities to choose have not kept pace with the increased possibilities to do so. The individual is not able anymore to relate inputs, decisions and present state to outputs. His environment not only seems to him more complex and interdependent than before, but has really become so. Therefore not only more output alternatives have to be evaluated, but each of these alternatives involves more variables and more unknown consequences, that moreover stretch further in time. This results in alienation as an *inability to make ever more complex decisions*: the computing capacity of the system becomes overburdened by not only having to make selections out of more alternatives, but also having to 'simulate' internally the hypothetical consequences of all important decision alternatives before making a final choice.

### **5.5 The effects of environmental overcomplexity on the system's output**

In the *output*, alienation can be redefined as the inverse of powerlessness: as a *self-realization* or *self-actualization problem*. Although functioning within the limitations of time, the individual in a complex environment is offered a far greater number of possibilities for thinking, feeling, and especially doing, than he can ever realize in a lifetime. From the viewpoint of the history of science, it is interesting to note that humanistic psychology, employing concepts like self-realization (Maslow), emerged in a period when as a result of the increased material wellbeing of large segments of the middle class in the industrialized nations, the more prosaic and immediate powerlessness situations of early Marxism became (for them at least) a thing of the past. Here too, we see that the modern forms of alienation don't refer to an inhibition of output options, like the freedom-limiting personality- or social structures of psychoanalysis and Marxism, but on the contrary to an overchoice of output options. Although one cannot speak here of powerlessness in the strict sense of the word, it is still a matter of a freedom one cannot fully use, due to difficulties inherent in choosing and to limitations of time.

One of the least thought of and most fascinating aspects of this overchoice

in output options is indeed that the *percentage of unrealized individual possibilities* increases with the complexity of the environment.<sup>36</sup> Possibilities for choosing one's profession and one's work, one's husband or wife, one's geographical location, one's 'specialized' circle of friends, one's ideology or religion, have all increased enormously over the past few decades, although criteria for making these choices are often lacking. Moreover, the individual is quite often fully aware of these possibilities: the 'communications explosion' has acquainted people with alternatives to their own life style, and has 'helped' them to set high standards in each of these areas. These standards are introjected by many individuals and thus become their own ideals, more often than not at variance with their usually more constricted reality. Phenomena like 'relative deprivation' and the 'revolution of rising expectations' are *recent* phenomena, at least on their present massive scale; which is probably why these terms are of relatively recent origin.

The important thing, moreover, is that none of these possibilities – however wild they may sound – are that farfetched or unrealistic by themselves, though the information about them tends to be incomplete in a complex environment, and may make for desillusions. One can, after all, settle in the Tahiti of the travel agency leaflet, if one really wants to and is willing to pay the price, even though it may turn out to be more of a tourist trap than a paradise; and one could possibly seduce that Hollywood movie actress, even though she may prove to be frigid and frustrated. What is typically lacking in these instances, is the possibility to engage in reality-testing; the one-way influence from the environment upon the individual does not permit him to reciprocate: he cannot influence the books he reads or the films he sees, and obtain a realistic feedback.

What one cannot do, moreover, is to realize all these possibilities taken together, although each of them separately may be within reach; not so much because of external constraints, but simply because time is lacking to try out everything. This may produce what Durkheim called the 'anomic passion for the infinite': a more pathological byproduct of the revolution of rising expectations.

All the 'modern' forms of alienation described here involve information processing disturbances, which are caused primarily by what is perhaps the main difference between modern and earlier times: the ever more accelerating complexity differential between the individual and his environment. Strategies to reduce alienation will only be successful if they are compatible with the specific form of alienation that has been diagnosed; they should be developed

for each of these modern forms<sup>37</sup> as well as for each of the classical (freedom-limiting) ones. A relevant diagnosis evidently presupposes a theory of alienation forms; a further application of General Systems Theory would be useful to help build such a theory. To that end the extremely abstract and simple model used here must naturally be expanded and made applicable to concrete empirical situations; such a task is beyond the limits of this article.<sup>38</sup> The same holds true for suggestions for a reduction of alienation.

## Summary

Some basic concepts of General Systems Theory have been applied to alienation theory, with the purpose of increasing conceptual clarity in this rather fuzzy area. The different forms of alienation distinguished in the literature were shown to have a common denominator if viewed on a sufficiently high abstraction level: all forms of alienation are information processing problems of individuals, viewed as open and partially self-programming systems, in continuous interaction with their environment.

The paper concentrates on three issues:

1. The main *forms or dimensions* of alienation as distinguished by Seeman (powerlessness, meaninglessness, normlessness, social isolation, and self-estrangement) are shown to be isomorphic with the five elements of a simple model, depicting the interaction of a system with its environment; e.g. *meaninglessness* is linked with information processing problems located primarily in the *input* of the system, etc.
2. A review of the literature indicates, that the causes of alienation are usually sought in one of the following three areas: a. alienation as *inherent* in human life (theology, some existentialists and Marxists); b. alienation as produced in early life as a result of *programming* (psychiatry, psychoanalysis); c. alienation as produced by the individual's *social environment* (sociology, criminology, political science, Marxism). From a systems viewpoint these three areas are essentially different and can be viewed as: a. limitations inherent in information processing itself; b. constraints imposed on information processing by the system's own program; c. constraints imposed by the system's environment.
3. When translated into systems terminology, many typically *modern* forms of alienation can be shown to be information processing problems resulting from the increasing complexity differential between the individual and his environment. These problems refer to: scanning, overchoice,

decisional inability, flexibility, identification, and self-realization or self-actualization.

## Notes

1. Richard Schacht points to an exception: cultural alienation; see p. 147
2. It cannot be sufficiently stressed that our focus here is on individual alienation. For us, alienation never refers to an objective societal process, as it does with most Marxists; a process that has become dissociated from the intentions of its initiators and starts living its own life, following its own laws, with adverse consequences for the individual. There is no disagreement here about the importance of this process in bringing about individual alienation; only about using the term alienation for what, in our opinion, are causes of alienation.
3. The opposite is not necessarily true: not every information processing disturbance should be considered a form of alienation. Amongst other conditions, the system must potentially be able to become aware of the disturbance.
4. Our postulating a common denominator does not imply that there must be an underlying unity across these different alienation forms in outside reality. If there is any unity at all, it is a construction of our minds, designed to arrive at a better understanding. Like Seeman, we do not claim that the different forms of alienation distinguished by him or by others form a unity in any essentialist sense, nor that they intercorrelate so highly as to warrant the assumption of unity on that ground. Even if, for example, meaninglessness would have any essence at all, it would be accidental if such an essence could be found precisely in those attributes, that meaninglessness has in common with other alienation forms. If essence is a useful concept at all, it should be found in concrete, individual, here-and-now instances of meaninglessness. Ota Šik once exclaimed: 'Truth is always concrete, only concrete'. The same goes for essences: if they exist at all, they reside in concrete, subjectivized slices of reality, and are too elusive to be fixated by thinking, which makes always use of abstract models, even at the level of 'thought concreteness' (see Israel, p. 48). Our position here is, however, that it is indeed useful to conceive of the different forms of alienation as information-processing disturbances, because within this systems-theoretical framework their possible interrelations can be analyzed more profitably than from the viewpoint of alienation theory itself.
5. The trivial machine has a constant internal state. The output variation is therefore completely determined by the input. In the finite-state machine the output variation is determined also by the system's internal state, while the Turing machine has access to a memory, which contains a symbolic representation of its past internal states. Minsky (see bibliography) gives a detailed description. See also sub 2.4.
6. See Ervin László, *System, Structure, and Experience; Toward a Scientific Theory of Mind*; New York: Gordon & Breach, 1969.
7. Some readers may have difficulties with this seemingly mechanistic approach. However, our claim that the observer can never directly tap the thinking and feeling processes inside his subjects does not necessarily lead us to adopt a behavioristic position. The black box approach does not imply that the researcher views his subjects as devoid of cognitions or emotions, as lacking consciousness or self-awareness. They can certainly have subjective states, although it is doubtful whether these are completely communicable. Whether or not the observer will conclude to the existence of a 'mind'

in his subjects, will largely depend on whether or not he is convinced to possess one himself: if he is, he will – when observing his subjects make the same kind of input–output transformations as he does himself – conclude that they have one too. More generally speaking, the inferences that are drawn are evidently also dependent on the observer's characteristics as an information-processing system: his program, the sum total of his experiences with its attendant world image, goals, perceptual distortions, etc.

8. Not all information within the system is a *direct* result of inputs; the system itself can generate new information by making novel combinations of stored information, although this new 'information' has to be reality-tested in interaction with the environment.
9. Of course, completely raw, uncoded, i.e. uninterpreted, reality cannot be perceived at all by any system with a *program* (= classifying scheme for selecting and storing certain inputs and linking them with a certain probability to certain outputs) and with *selective filters*, not only in the 'negative' sense of defence mechanisms, but also in the neutral sense of structuring (de-randomizing, coding) mechanisms; e.g. reality perception in children is probably both widened and narrowed down to a large extent by the time they acquire the basic concepts of their language, and start perceiving reality in terms of these concepts. Perception inevitably takes place in categories; these are always indexical and intersubjectively formed and, – though also culturally given – idiosyncratic to a certain extent (Osgood et al.) and therefore subjective.
10. Ideally a rank order at any given moment, though both the order and the number of goals vary from situation to situation, depending on the opportunities offered by the environment (inputs), and the predominance of certain needs within the system (the system's state). A complete rank order of goals is of course never achieved.
11. See Melvin Seeman, 'On the meaning of alienation,' *American Sociological Review*, vol. 24, no. 6, Dec. 1959, pp. 783–791.
12. See also Richard Schacht, pp. 142–143.
13. Never: alienated; that would constitute a reification, and would moreover be sheer nonsense.
14. See also Peter Archibald, p. 63.
15. See Menachem Rosner, Changes in the concept of alienation after Marx, *Revue Internationale de Sociologie*, vol. 5, no. 2, 1969, pp. 63–78. The difference with Seeman is, of course, that Marx was thinking in terms of *objective* powerlessness, although he was certainly sensitive to the subjective side of the other dimensions.
16. This is true for Seeman's other alienation forms as well: their definitions refer to expectations, and in that sense they are, strictly speaking, located in the decisional functions, although they pertain to disturbances elsewhere in the system: input, output, state functions, and also decisional functions. Moreover, Seeman's definition of powerlessness has to do more with behavioral ineffectiveness (i.e. the output is not inhibited, but the expected reaction from the environment is not forthcoming) than with behavioral inhibition. Nevertheless, output inhibition seems to be the most inclusive way to define powerlessness: whether the intended output is inhibited by the system itself (e.g. taboos, generally the result of previous and introjected inhibition by outside forces) or by the environment (e.g. excessive resistance to one's goal-directed efforts) is quite another matter.
7. One should ask three questions here:
  - Is the individual objectively powerless?
  - Is he aware of being powerless?
  - Does he ascribe his powerlessness to the right causes?

In the case of Marxist powerlessness, in its first stages, the answers are: yes-yes (or eventually no if false consciousness is so strong, that he represses even the realiza-

tion of being powerless, and not only the true causes of it) – no (false consciousness is operating on this level anyhow). The implicit premise is that no effective action can be undertaken before the individual or class becomes aware of the real reasons of its powerlessness. Another implicit premise, and an optimistic one at that, is that once this awareness exists among the majority of the members of the suppressed group, effective collective action can be undertaken. The dilemma of the revolutionary is here, in good systemstheoretical fashion, that the proletariat must first be driven to action before it can shed off its false consciousness, which, in turn, is a prerequisite for effective action. One must first try to change a system before one can see what makes it tick; action is necessary to get the right motivation for action.

It is interesting to note, that in the case of psychiatric powerlessness, the answers to the above questions are: no - yes (incorrect assumption of being objectively powerless) – no (there is only subjective powerlessness here, because the inhibition is system-determined *now*, although it may originally have been caused by the environment).

18. It might be argued, that psychiatric powerlessness is not an information-processing problem, but that it denotes, on the contrary, an excellent ability – in the past, at least – to process the parents' 'hidden communications'. Nevertheless, we view such an oversensitive tuning in to external information-sources as an information-processing problem, since the original message apparently was received and registered so loud and clear that it prevents today's information from being processed in a 'normal' way.
19. Again, perhaps, it should be stressed that our position is certainly not a purely mechanistic one: phenomenological perspectives are not excluded, and it is not implied that the subject merely registers passively whatever reaches him from the outside world, and does not participate in its creation. On the contrary: meaning results from the interaction between input and system. Completely irrelevant information presents no problem: when it cannot be coded in any relevant categories, it is not even registered. The problem exists mainly in those cases, where a great deal of information is inadequately registered and therefore has to be given the meaning 'meaningless', i.e. where the system concludes that certain inputs clearly have *some* meaning, although it cannot be exactly determined because it is contradictory to, or not at all connected with, other bits of information.
20. See the experiments on sensory deprivation, described sub 2.4.
21. Reality testing implies making a (hypothetical) deduction from an input, and then giving an output based on this deduction in order to see whether the resulting input conforms to predictions.
22. See N. Luhmann, e.g. *Zweckbegriff und Systemrationalität* (Tübingen, Mohr: 1968), who envisages reduction of environmental complexity as one of the main functions of systems, and also W. Ross Ashby's *Law of Requisite Variety*, which states that only variety in the system can reduce the variety due to the system's environment, i.e. the system's codes must be as complex as those of the environment, if the system is fully to make sense of the latter and be able to steer it completely.

See also Basil Bernstein's work on elaborate versus restricted linguistic codes – or vocabularies. Elaborate codes, largely a matter of education, facilitate understanding of a complex world and thus tend to reduce meaninglessness.

23. Of course they don't *have* to be given: heuristic shortcuts and semi-automatic sub-routines can be extremely useful to prevent decisional overload; to react to every situation as if it were completely novel would be highly dysfunctional. See also: L. U. de Sitter, A systemtheoretical paradigm of social interaction: towards a new approach to qualitative system dynamics, *Annals of Systems Research*, vol. 3 (1973), pp. 109–140.
24. A term coined by Eric Berne ('Games people play', New York: Grove Press, 1964) to indicate that no (neurotic) games are being played, i.e. that no automatic and fixed



input-output transformations exist, but that the individual has complete access to his situational variables, can use any of his experiences as an intervening variable determining his reactions or input-output transformations.

25. 'Social' is understood here in a wide sense: the breakdown does not necessarily refer to contact with other persons, but may also pertain to social products (e.g. books) or institutions. One may be socially isolated in one area, but not in another; and social isolation is only complete in cases of sensory deprivation, as described below.
26. As such, this 'going off line' *may* be beneficial for the internal integration of the system; in the literature, social isolation is often described as having an inverse relationship with self-estrangement: be true to yourself, or conform to society.

Schacht (p. 147) deals with alienation in the sense of dissatisfaction with popular culture, and stresses that it is not a problem in need of a solution, because it is the expression of a fully conscious desire to keep one's distance from it.

27. See Richard Schacht, *Alienation*, p. 157 ff. (Allen and Unwin, 1971).
28. In principle, two different ways to store inputs in relative isolation may be discerned:
  - storage in extremely *peripheral* positions in one's total information structure: i.e. in 'watertight compartments', with little overlap with other concepts or memories, and consequently limited possibilities to accidentally hit upon them by association;
  - storage in extremely *central* locations: this is especially the case when the categories in which the inputs are stored have such an importance, that nearly all later inputs, in whatever area, are directly or indirectly connected with them.

In the first case, one cannot reach the isolated tree through the wood; in the second case, one cannot see the wood through the trees. Inputs become information because they are embedded, through an intricate interactive process, in an already existing information structure; and they remain information only when they are not de-activated but are regularly 'hit' by new inputs. Our hypothesis, more fully worked out in a forthcoming publication (see footnote 38), implies that repression does not refer to over-peripheral information storage, as the imagery around the concept seems to suggest, but, on the contrary, to over-centralized storage. After all, one does not usually repress unimportant problems; the important ones may be repressed as a result of the system's all-out effort to solve them, mobilizing all its experience at hand, and connecting it to the problem area - which has the latent function of making the problem disappear, if it is not solved.

On the other hand, an example of over-peripheral storage might be found in the unrealized potential inherent in Maslow's concept of self-actualization - which is limitless, as Cherns convincingly argues, and in our conceptualization consists of suboptimally coded information bits. When connected more with the remainder of experience, this might lead to innumerable new combinations and could lead to the kind of system state Maslow describes as self-actualized. To put it simply: over-peripheral storage has to do with forgotten rather than repressed information. Though it has been forgotten as a result of its insufficient links with other more problem-relevant information, it may yet, at a later stage, prove extremely important for the system's further growth.

29. Although there are  $5! = 120$  different possibilities for a one-to-one correspondence between the Seeman-dimensions and the model components, it is to be hoped that the plausibility of our choice has been shown.
3. This is tantamount to saying, that a system can do nothing else with information in the environment but: conclude it is there (E), receive (part of) it (I), store it (S.F.), make deductions from it (D.F.) and act on the basis of these deductions (O).
1. See R. Schacht, op. cit., chapter 5, and pp. 271-73 (bibliographic references to authors quoted).
2. Evidently, alienation can be produced via *primary* group contacts *throughout life*, and

not only in early youth (Goffman's 'alienation from interaction'); this position is especially taken by (social) psychology, though the lines with psychiatry are often hard to draw. Yet, in spite of the importance of primary groups, we consider such causes of alienation to constitute a subform of the 'sociological' rather than the 'psychiatric' ones, for the following reasons:

- This Goffman-type alienation starts *later* in life, which makes all the difference as far as being programmed is concerned: when the alienating influence in the environment is removed, alienation itself disappears, whereas in psychiatric alienation the essential point is that alienation tends to continue even when the alienating influences are removed, because the program continues to function unchanged.
  - It can be reduced by changing the group structure, or by removing oneself from the group (if this is not impossible: prisons, military service), but *not* by changing the *subject* through some kind of individual therapy, as is necessary with psychiatric alienation.
  - It pertains primarily to unpleasant, but not *necessarily* to mentally unhealthy situations (forming a lonely 'minority of one' in a group, completely different as to subculture, goals, premises, convictions, etc.) and insofar as they *are* mentally unhealthy they have a better chance of being recognized as such and certainly don't form learning situations.
33. As the opposite of the alienation described in footnote 32, alienation caused by wider social structures can be produced in early life, but then *only indirectly*, via primary group members (parents transmitting culturally induced neuroses, kindergarten teachers indoctrinating alienated values, class-bound language barriers, etc.). We subsume this subtype under 'psychiatric' alienation, because catching it early vs. later is a more important criterium than catching it via primary groups vs. via wider social structures (see the arguments in footnote 32).
  34. New York, Free Press, 1973.
  35. Efforts to reduce environmental complexity by *lowering* internal complexity may give a temporary illusion of insight, but are ultimately ineffective because outputs (actions) based on an oversimplified image of the environment lead to an increase in uncodeable inputs.
  36. The mass society theorists have correctly stressed some of the advantages of 'Gesellschaft' over 'Gemeinschaft': a more differentiated environment, with sometimes less strict mechanisms of social control, may indeed increase possibilities for human self-realization. However, our point is that the percentage, and not the absolute number, of unrealized individual possibilities is increasing.
  37. See Alvin Toffler: 'Future shock', New York: Random House, 1970.
  38. The author is presently working on such a theory; publication can be envisaged for 1977 in the *International Library of Systems Theory and Philosophy*, edited by Ervin László.

## References

### *Alienation*

- Israel, Joachim, *Alienation from Marx to Current Sociology* (Boston: Allyn and Bacon, 1971).  
 Johnson, Frank (ed.), *Alienation; Concept, Term, and Meanings* (New York: Seminar Press, 1973).  
 Geyer, Felix, *Bibliography Alienation* (Amsterdam: Siswo, 1972).  
 Mészáros, István, *Marx's Theory of Alienation* (London, Merlin Press, 1970).  
 Schacht, Richard, *Alienation* (London, Allen & Unwin, 1971).

*General Systems Theory*

- Ashby, W. Ross, *An Introduction to Cybernetics* (London: Chapman & Hall, 1956).
- Ashby, W. Ross, *Design for a Brain*, 2nd rev. ed. (New York: John Wiley & Sons, 1960).
- Buckley, Walter (ed.), *Modern Systems Research for the Behavioral Scientist* (Chicago: Aldine Publishing Cy., 1968).
- Garvin, Paul (ed.), *Cognition: a Multiple View* (New York, Spartan Books, 1970; especially Chapter 2: 'Thoughts and Notes on Cognition' by Heinz von Foerster).
- Lászlo, Ervin, *System, Structure, and Experience; toward a Scientific Theory of Mind* (New York: Gordon & Breach, 1969).
- Luhmann, Niklas, *Zweckbegriff und Systemrationalität* (Tübingen: Mohr, 1968).
- Luhmann, Niklas, *Soziologische Aufklärung*, 2nd ed. (Opladen: Westdeutscher Verlag, 1971).
- Minsky, Marvin L., *Computation: finite and infinite Machines* (Englewood Cliffs, N.J.: Prentice-Hall, 1967).