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ABSTRACT

A new approach to the study of text building behavior is possible through the application of Scanator. This paper consists of a demonstration of some of its fundamental functions. These are suitable in a study of text building. The basic concepts, expressed through an analysis of a small part of an interview text, derive from a thermodynamic treatment of text building. In a first phase, text material is transposed and arranged for automatic processing. Constituent of this phase are five components. A second phase is associated with joining and linking processes. At the kinetic level they provide for the book-keeping of reversible and irreversible flows. Through channelling of textual elements, supplementary operations fill out all places where textual material is lacking. The second phase terminates when all involved processes have reached their steady states. Strings of graphemes give rise to larger functional units through partial qualifications. Results demonstrate how points relate at various distances, pressures, and forces; and that points of different kind are separable when the distance measures reach their critical limit. At this limit, a third phase comes into existence. Processing during this phase concerns the assembling of point into natural groups and the naming of these groups. That verbal flow processes can be specified at the kinetic level suggests that point attractors can be named. When the curvatures of point attractors lean toward a virtual midpoint it becomes possible to demonstrate their state attractor. Results show that a state attractor is the proper constraint of its underlying kinetic processes. Contains 11 references, and 11 tables and 8 figures of data. (Author/RS)

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Abstract

An entirely new approach to the study of text building behaviour is possible through the application of Scanator. The present article consists of a demonstration of some of its fundamental functions. These are suitable in a study of text building. The basic concepts, expressed through an analysis of a small part of an interview text, derive from a thermodynamic treatment of text building. Through Scanator, a number of qualitatively distinctive phases at the kinetic level of processing are made evident. In a first phase, text material is transposed and arranged for automatic processing. Constituent of this phase are five components. These are manifest as functional constants and variables of the AaO machine. Processing ends when a matching algorithm has identified graphemes or strings of graphemes that carry their values. A second phase is associated with joining and linking processes. At the kinetic level they provide for the book-keeping of reversible and an irreversible flows. Through channelling of textual elements, supplementary operations fill out all places where textual material is lacking. The second phase terminates when all involved processes have reached their steady states. This implies that a number of points have been diffused over the whole body of the text. In this context, body means more than just an organism. Strings of graphemes give rise to larger functional units through partial qualifications. It is demonstrated how points relate at various distances, pressures and forces. Further, it is shown that points of different kind are separable, when the distance measures reach their critical limit. At this limit, a third phase comes into existence. Processing during this phase concerns the assembling of point into natural groups and the naming of these groups. That verbal flow processes can be specified at the kinematic level suggests that point attractors can be named. When the curvatures of point attractors lean toward a virtual midpoint it becomes possible to demonstrate their state attractor. A topological invariant is demonstrable, whenever two extracted point attractors meet their state attractor. Finally the results show that a state attractor is the proper constraint of its underlying kinetic processes.

The major goal of the present article is a study of text as a highly flexible and dynamic system. Subordinated to this goal is the purpose of showing how the producer of a text generates information and communicates his point of view. The emphasis is therefore on the co-ordination of textual movements and consequently on the discontinuities in evolving text. The concern will be with text as inter-medium and text building behaviour as the particular mode of organising the co-ordinative relations assumed to produce higher order functions.

Previous research has revealed an intimate relation between textual agents and textual objectives (B. Bierschenk, 1996 a). From a production point of view, this means that the agent (A) function carries the kind of energising potential (E^P) that a text producer has at his disposal. Moreover, without successful identification of the A-function, a text would be without an intentional source and self-reference would be non-detectable (I. Bierschenk, 1992 a). Any body, inclusive text, conserves this potential and a dissipation of it puts both stress and strain onto developing texture of a body. This process refers to the history of a thing, pattern formation and phase transitions. In conclusion, any principled study of text means the study of transformational steps in the process of going from one pattern to the next. What matters in text production is multi-functionality of graphemes and strings of graphemes at the kinetic level as well as multistability and change in the patterns at the kinematic level.

Depending on the degree of elasticity in a verbal flow and the degree of viscosity (strength) or cohesion of its surface conductivity, a variety of co-ordinated movements can arise. The controlling factors of Table 1 are assumed to govern this transformation:

Table 1.

Processing of Graphemes

	Linguistic Expression	
Movement	Frozen	Unfrozen
Frozen	Association of Graphemes	Classification of Strings
Unfrozen	Linkage of Components	Formation of Patterns

Table 1 builds on two basic control factors. The first one refers to one's ability of producing a flowing text, while the other addresses the surface tension of the verbal flow. From an ecological point of view, it can be said that significant informational invariants exist only over time. Nevertheless, when confronted with the problem of behavioural invariants, scientists shift easily attention toward the study of static spatial and temporal segments. By approaching text this way, movement gets frozen and text becomes restricted to the connection of a series of predicates. Under this condition, text processing is linear and feature oriented. Processing builds on computational procedures that regard higher order functions to be negligible entities. What operates on discrete textual elements is the syntactic model that produces rigid and cross-sectional segmentation.

Association of graphemes. With a syntactic-semantic approach, single graphemes are conventionally arranged into strings. Moreover, strings are classified which provides for the typing of strings. Class inclusion and associative relations between classes can be farther typed into state relations. Just like any associative arrangement of elements into pre-determined hierarchies, lists of textual elements are treated as hierarchies. From a methodological point of view, a frozen texture is defined by an ex-

pression that is symmetric and consequently one-dimensional. The mistake made by the algorist is that he regards the grapheme as static and timeless. The consequence is that the grapheme, conceived of as an element, exists independent of its origin and outside any perspective control.

Classification of strings. This pre-requires a mechanical model that can process class membership in a uniform fashion. It follows that frozen movements require unfrozen expressions to be treated as changes in positions or between classes. Further, its syntax implies that any outcome has to disregard fluctuation. Thus, when the implicated order of natural language expressions has been replaced with associative links, there is no way of circumventing their augmentation with semantics and their interpretation within a standard context.

Linkage of components. However, in a natural context it is unlikely that an artificial time dimension can form the foundation of discovering processes of growth. Clearly, on the ecological level, text analysis implies something fundamentally different from computational accessibility. What is needed is an entirely new method and new concepts. In essence, an unfreezing of the movement factor of Table 1 means that "text building behaviour" has been determined as fundamental in the communication of ecologically significant information.

Formation of patterns. Within the Agent-action-Objective (AaO) model textual movements of high precision have been identified and demonstrated experimentally (B. Bierschenk, 1996 b). These movements are self-referential and very sensitive to Eigen-dynamics. What is understood and what is performed throughout text production is related to the text producer's ability to perspectivate actions and events. This implies that textual movements give expression to a certain degree of self-inclination. When individual elements are co-ordinated in order to form patterns, natural language serves as carrier of mental functions such as consciousness. Since novel differentiation and integration rest on changes in the verbal flow, it is essential to study textual movements together with their constraints.

The Origin of Textual Movements

An agent (X), planning an action (a) toward an objective (Y), is dependent on a number of components and dimensions. Their interrelation is expressible through their dimensionality as indicated by the superscripts (0, 1). The points (.) in the spatio-

Figure 1.

One-dimensional representation

temporal arrangement of Figure 1 are preceding and succeeding the line (L^1) and mark the interval of processing successions of fractions.

The processing consists of an associative connection of points that increases monotonously as the process of production transits from one position (or state) to the next. The one-dimensional approach of Figure 1 implies that any particular movement must be broken down into primitive events. This procedure may be exemplified with the ordering of the following proposition (a (X, Y)):

Event (A): (Present State)
Object: M(Y)
Time: A : B: C
How: Event (B): Transition
Event (C): New State

Event (A) may mean that a hand is open. The following event (B) may imply a transition to a new position, e. g., a hand is lowered, while event (C) gives the result in return that may be closing or grasping. This definition has no need for information on, for example, direction, inclination or number of connections involved in sequencing. It ignores both the possibilities of rotation and interaction between any two events. Because (L^1) is assumed to represent optimal processing time, time is a function of the angular displacement of zero degree.

Procedural Semantics. It means a conditional processing of natural language within the framework of predicate logic. A destruction of natural language expressions provides for a composition of elements into semantic nets (I. Bierschenk, 1995). It is common to connect textual elements logically with the help of the indicator-value pairs (IS-a) and (HAS-a.). Simply stated, the minimum number of dimensions that are necessary for a complete description of the information of Figure 1 is geometrically defined by a symmetry relation. By pre-determining the context and the sequencing, optimal processing time becomes a monotone increasing function of the number of involved predicates. It should be understood that semantic nets can be designed and organised in various ways, but the nets are structurally empty.

Behavioural semantics. In developing a behavioural approach, the purpose of its founders was to avoid the limitation of a procedural language. By constructing semantic differentials, their measurements of meaning could be built on the power of statistical mechanics. By adding a second dimension to Figure 1, it is possible to arrange predicates into a Euclidean system. This means that (L^2) allows for a co-ordinative arrangement of predicates in two dimensions. With respect to their rank order, predetermined features of predicates constitute the basis in the study of similarity relations. A predicate, represented as point occupying a position on a co-ordinate, is the starting-point for the judgement of any two objects or arguments (X, Y). With reference to a particular attribute, they may be similar, but different on all other attributes of relevance for their semantic description. By choosing a measure of distance, it is possible to get numeric estimates of their degree of dissimilarity. Sections in a Euclidean mesh, containing relatively dense concentrations of points, allow an associative grouping of the involved arguments.

In the process of agglomerating associated points, variance may be partitioned into Within Group Variance (W) and Between Group Variance (B). Adding the first term to the second gives as its result the Total Variance (T) which is a constant. Minimising (W) as criterion for grouping implies concurrent maximising of (B). This relation is valid for any differentiation of a sample of points and may be viewed as foundation of dissimilarity integration.

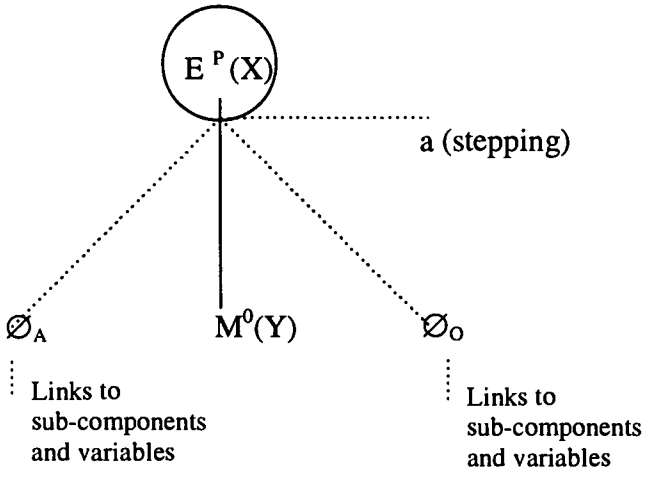
Logical, procedural and behavioural semantics study information processing by focusing on organisational features and feature organisation. They require a normative imposition of world knowledge and conceptualise mental functioning as calculation that controls the statement of facts. Suitable for testing the control of facts are linguistically well formed and logically well sequenced textual elements. In the context of logical calculation, the operations of deduction and inference are absolutely necessary, but they are non-sensitive to a natural environment. In sharp contrast to the processing of facts, which is condition oriented, stands the processing of a perspective, which is action oriented.

The AaO Model

It will be demonstrated that (1) the producer's experiential context, and (2) the textual contexts have ecological significance. At the ecological level, the focus is on information processing, and consequently on the language space. A space in three dimensions (L^3) is necessary to represent the functional, structural and dynamic aspects of the model. In the following, an approach is presented that focus on the agent (X) as potential source and on intentional acts (a) as umbilicus in the diffusion of a potential. Thus, it is action oriented and considers two contextual levels of processing, namely the kinetic and the kinematic. Figure 2 makes this point explicit. Displacement is essential, if the symmetry of the objective ($M^0(Y)$), shall be broken. A specific symmetry breaking arrangement and a point of dispensation of (E^P) is required. Just as any open system can organise itself, text as open system is self-organising. This means that text

Figure 2.

Rhythmic Clock-like Pendular Movements of the A's and O's



can grow. Inherent in the process of growing is the process of angular displacement through a rhythmic pendular moving of textual elements. This circumstance needs to be focused upon, since the intention of communicating an observation requires a scope of action. The beginning of verbalising an action or event is always indicated by a period. A period (.) acts as sentence opener. Extending from the verb is a cord, spliced into fibres, as indicated by dashed lines in Figure 2. The geometrical result is a double pendular configuration. On one fibre swings the textual agents and on the other are swinging textual objectives. The verb-fibre functions as the umbilical cord through which the system begins to live (I. Bierschenk, 1992 b).

Joints (∅)

The verb constitutes the necessary functional constant, that joins a textual agent with a textual objective. Within periods, it is possible to observe couplings and nested relations. Through additional joints prolonged actions can exists over fractions of periods and entire periods. A coordinative coupling of verbs captures the nesting relations between components, sub-components and variables, regardless of what fractions or periods are involved and the type of language over which they interact. Transforming an observation into written form needs to be based on the explicit statement of a verb. Otherwise, it would mean that the form is without signs of life.

Natural language processing involves a number of transformations, whose timing and spacing is unknown. For example, a steady state ("Fliessgleichgewicht") in the relation is reachable through a counter-clockwise swinging of the A's and O's. Steady states exist if and only if this process can elevate both agent and objective to the textual surface. Thus the volume-elasticity of natural language is appropriately represented in a (L^2 L^3) space (B. Bierschenk, 1993).

In this space (L^5) the structural relations of a verbal expression become apparent during the course of text processing. Moreover, the dynamic of the regime of Figure 2 is governing integration and disintegration processes. Any time an action begins to organise textual elements into a co-operative relationship, a verb initiates a clock-like pendular movement. Dynamic moving of pendulum means the angular displacement of textual agents and objectives.

Links

Typical of an act is its shifting perspective. Shifts are dependent on the degrees of freedom as determined by the number of participating links. A link from the A-component to the verb indicates one degree of freedom. If a directed displacement of textual agents is feasible, links provide for their soft anchoring. Links also allow for the development of an orientation. The degree of freedom in the orientation is determined by a link from the verb to the O-component. Links that are attaching two or more joints achieve higher degrees of freedom in perspective variation.

But there are also links at the other end of the components. These links extend the elasticity in the textual configuration. As shown in Figure 2 the A-component has a certain number of degrees of freedom. The A-dummy ($\varnothing_A$) marks the place where links operate. Syntactic cues are utilised in the process of linking substantial information with the dummy. Four links are found to be of import for a successful processing. The same situation applies to the joint at the end of the O-component. An O-dummy ($\varnothing_O$) allows five links to operate in the coupling of various sub-components.

Because points of view are chosen according to particular interests, it follows that internal constraints force the process of communication into certain directions. Hence, rules of supplementation are needed in order to bring various textual elements in proper relation. The assumption that a particular perspective is eigen to the verbal flow implies that viewpoints are intentionally expressed. Both the organisational layout and perspectivation of textual movements imply the co-operation of components with shifting functions. A fluid verbal flow, involving twining and twisting, is drawing into its centre all textual context that surrounds it. The result are convection rolls that arise without any external instructions and are extending over flow-fields of variable length.

Important for its geometrical demonstration is the co-operation of the components themselves and their interaction with the local textual context. A model for analysis these flows and vortices of text building has been presented within the frame-

work of "Scanator". Part of it are methods for studying mental functions and degrees of consciousness. Another part is a computerised system, called PERTEX (B. Bierschenk, I. Bierschenk, & H. Helmersson, 1996), which provides routines for automatic processing co-ordinated textual movements and phase transitions.

Steady States

Intended is a demonstration of behavioural discontinuities by considering an interview text concerning a management problem. Scanator locates and makes use of these discontinuities in text production. The theme is on the policy of a community in Northern Sweden. A municipal officer states this policy by describing his interaction with the community.

The interview has been typed on a sheet of paper where the line of production runs from left to right and from top to down. Transposing this format into a column does not change anything except the formatting of the strings of graphemes. In agreement with Figure 1, the PERTEX system of Helmersson (1992) generates, a row by column table, where each string takes up its own row. The result of transposing the first six strings of the interview is shown in Table 2. Implicit in any period of writing is

Table 2.

Text Format of PERTEX

Swedish	English
Titta	Look
på	at
hur	how
inställningen	the attitude
är	is
idag	today

a starting point. This point has to be made explicit which suggests that the system has to perform the insertion of a period [.]. When all formal requirements are in place, a matching algorithm searches for instants of constants and identifies those strings by supplying codes. At times, a clause opener is only implicit, especially at the beginning of a sentence, which directs the system to insert a technical one, namely [that]. PERTEX identifies in the example of Table 2 the following: (1) a verb = 'Look', (2) a preposition = 'at' and (3) a clause opener = 'how'.

Text processing can now precede and concentrate on the completeness of the expression. What is the meaning of 'Look'? Grammatical analysis would conceive the verb to be intransitive. This would mean a classification and an attempt to place the verb into a condition oriented frame, where its symbolic content is static, timeless and independent of its origin. However, in an action oriented approach the verb is the nucleus and a complete observation must always express an AaO unity. On the other hand, on the observation level this relation is sometimes implicit. This circumstance is marked during processing by inserting appropriate placeholders in agreement with the model of Figure 2. The placement of the dummies together with their codes is given in Table 3. The pointer function of the sub-component (code 60) directs the textual movement toward the objective of attention. This implies the need for an indication of direction. The orientation involved concerns a standpoint. As shown in Figure 3, from

a geometrical point of view, the processing has reached a state where the operation of the flow-field dynamics becomes apparent. It is the language area that contains the

Table 3.

Insertion of Placeholders

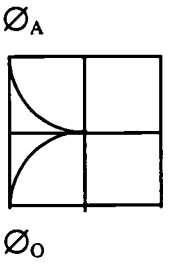
Codes	Swedish	English
01 Block 1	[att]	[that]
30	$\varnothing_A$	*X*
40	Titta	Look
60	på $\varnothing_O$	*(the attitude + today)**

* Italics mark the supplementation

point of observation. This point is surrounded by structure. The AaO unity of Figure 3 is defining the flow-field. Implicit is a pattern that needs to be specified. Referring to the Agent variable (X), its supplementary movement generates a specific information

Figure 3.

Establishment of a Steady State



flow toward balance with its characteristic invariant at the centre of Figure 3. The remaining dummy can only be supplemented through the processing of the clause opened by ('how'). Table 4 shows the relevant codes together with the strings.

Table 4.

A Verbal Statement

Codes	Swedish	English
01 Block 2	hur	how
30	inställningen	the attitude
40	är	is
50	idag	today

What the text producer has achieved, is a specification of the O-component. Ecologically seen he is focusing his attention on a particular circumstance. The observation gives expression to a fact and the direction of the pendular movement goes to-

ward an equilibrium. Its trajectory is specified everywhere in the verbal flow field present. The observation is focused on a singular point that is reciprocally determined by the trajectory. Thus, the dual specification contains the following matrices: Matrix No. 1. (50/30 = 1/1); Matrix No. 2. (30/50 = 1/1); Matrix No. 3. (60/30 = 1/1); Matrix No. 4. (30/60 = 1/1). Obviously, the movement is restricted to one viewpoint (50), and one standpoint (60). If these points express an abstract or a concrete orientation is of no import. A stable standpoint is the result of the processing: (X → (the attitude + today)). It consists of an explicit agent-objective integration. An integration of this kind is an explicit self-indication, because both components are manifest. The displacement operation has propelled a textual agent and a textual objective into the same sink.

Channelling

The link from the first to the second AaO is the key that opens a channel for a reverse verbal flow, namely back into the empty sink. Thus, development toward integration is the result of reversible flows. Furthermore, the link from the first AaO unity to the second allows an upward elevation of the conceptualisation (the attitude + today). It follows that information processing as a function of verbal transformation incorporates the thermodynamic level. The resulting pendular swings produce two-directional moves. Displacement of the agent as well as the objective component generate a steady state and consequently AaO unity. In its simplest case, the process constitutes a twofold unity. An action can also constitute a manifold. This is a more complex case, because a co-operative relation extends to more than one sentence part. Complexity, in this sense, is definable by the number of sinks, participating in the dissipation of energy potentials. Through this kind of textual equilibration, it has been possible to discover the extension of verbal flow fields and to define a measure of length over these flow fields (B. Bierschenk, 1993).

Soft joining and multifunctional linkage at the kinetic level has its equivalence at the kinematic level in multi-stable patterning. The joints at the kinetic level control the verbal flow. Characteristic of this flow is that it carries information rather than force. In their channelling function, joints act like gates. An illustration of the opening and closing of gates is illustrated for the present body of text in the form of a double helical configuration (B. Bierschenk, 1993, p. 5).

An understanding of the informational aspect of a verbal flow process is enhanced by observing an individual joint. When it is open, its links become active keys to strings of graphemes, embedded in a local textual context. On the other hand, when the joint is inactive, the respective channel becomes locked and the flow of information is halted or reversed. Spontaneous opening or closing varies between different states of the involved A's and O's. A change in opening or closing requires an overcoming of some resistance or momentum. It follows, that pendular movements generate states in which the system moves from a non-equilibrium steady state to an equilibrium steady state. The alternative is a loss of stability and subsequent appearance of a spontaneous fluctuation. Hence, the evolving process becomes hysteric and as a consequence, jumps into a new path.

In conclusion, intentionality as potential source relates to transport processes. Wherever its trajectories become stable, information becomes concentrated. This is a result that is of significance to the ground or reason. Evidently, at its particular location, the integrative move (the attitude + today) manifests a concentration of information. Integration contributes small curls. These are of thermodynamic character and can emerge because of the links interconnecting two or more AaO's. In the evolving of an

adiabatic trajectory, in turn, they govern and/or constrain the behaviour of individual components.

Causality of this kind is circular. When a point on the adiabatic trajectory becomes stable and reproducible, it has generated information. The main difference between circular and linear causality implies that the latter disregards irreversibility. Under this condition is the verb "is" conceived of as a formal link or logical copula. Its propositional treatment makes the nominal in the second clause testable for its truth conditions. This measure discards the contextual embedding. But information is nothing that can be reduced to logical mechanics and semantics or content analysis. In contrast, the present approach puts its stress on the study of textual dynamics and structural invariance instead of concentrating on the content of a text.

The fundamental assumption is that trajectories of a dynamic system are information guided. As long as a source is physically connected to a sink are irreversible flows producing instabilities. Given that a steady state begins to fluctuate, this can be discovered and valued. Instabilities open the path to point attractors that are indicative of dynamical system states. Single points can be mapped onto the point attractors. This mapping corresponds to the amount of extractable information. These attractors control the system's move through its behaviour space. Table 5 shows the next step in the establishment of a behaviour space.

Table 5.

Continued Text Production

Codes	Swedish	English
01 Block 3	och	and
30	det	it *(the attitude + today)**
40	är	is
50	ju	you know
50	inte	not
50	bara	only
60	bland	among
60	de	the
60	kommunalt	municipally

* Italics mark the supplementation

A pointer function (code 60) appears. It says that the two strings following the preposition ('among') pertain to the Ground component of the Objective. These give explicit expression to the "grounding" or reasoning of the text producer. Thus, through the processing, a further stable point is emerging. Thus far, the umbilical cord does not change its course at the clause opener ('and'). The compound (the attitude + today) as a curl, continues to circulate information. The next time it can be observed is marked by the language specific placeholder ('it'). An alteration in the production generates a new viewpoint (you know not only). This changes the specification. Now, the following matrices are characteristic of the present period. Homorhesic growth continues to determine the trajectories of the Figure- and Ground component: Matrix No. 1. (50/30 = 2/2); Matrix No. 2. (30/50 = 2/2); Matrix No. 3. (60/30 = 2/2); Matrix No. 4. (30/60 = 2/2).

It is the book-keeping function of PERTEX that helps in tracking the changes in the flow. Abstracting or extracting single points depends on the rhythmic, clock-like

regime of the AaO mechanism. Several changes have occurred. Viewpoints have changed into standpoints. Several textual agents have been introduced and the function of viewpoints has changed into textual agents. Points of observation have become explicit in their integrated form. All these functional changes are due to the discovered generic change mechanism (B. Bierschenk, 1984, 1991). This mechanism is quite independent of the involved potentials. Therefore, it allows a theoretical modelling of textual pattern dynamics (B. Bierschenk, 1996 b). More information on the many changes and channelling operations is involved in providing for the next displacement. Table 6 accounts for an unfolding of the interactive relation between the observer and the observed.

Table 6.

Unfolded Interactive Relationship

Codes	Swedish	English
01 Block 4	[att]	[that]
30	$\varnothing_A$	*(X)*
40P	anställda	employed
50	$\varnothing_O$	*(the majority + you know)**

* The objective appears in Table 7 from where it is elevated upward

A critical region of the flow-field is also appearing in Table 6. It contains a verb. The identified verb-string is 'employed'. At least with respect to the textual surface, it seems to produce semantic noise. At a deeper level, however, it acts as a perturbation by increasing the enhancement fluctuations of the system. Clearly, instabilities have their origin in the verbal flows. In text building, it is the source of behavioural competition and co-operation.

Competition appears in the actual case between the degree of a forceful driving flow in the channels and the degree of surface tension of the resulting text. Concurrent forces have to be differentiated and integrated, because the cohesion of a textual outcome is directly related to the driving forces. The co-operation of an action (a) with an

Table 7.

Transitory Behaviour

Codes	Swedish	English
01 Block 5	,	,
30	de	the
30	flesta	majority
40	tycker	thinks
50	ju	you know
01 Block 6	att	that
30	jag	I
40	har	have
50	ju	you know
50	min	my
50	lön	salary

objective (O) reflects this circumstance. Observable is a growing inability of the system to maintain its soft trend of alteration. In the actual region, the system displays transitory behaviour. It follows that the system must move to new regions and process new patterns, because a definite AaO unit is not yet apparent. With the purpose to show the outcome of the processing, Table 7 reflects the establishment of two new steady states. A co-ordinative link allows the integrated agent ('the majority + you know') to be circulated into the ($\varnothing_O$) of Table 6. A balancing of the objective in relation to the agent is achieved. Thereafter the cord is twisting around its own axis and a marked decrease in

Table 8.

Long Range Channelling

Codes	Swedish	English
01 Block 7	,	,
01	varför	why
30	$\varnothing_A$	*(I)*
40	ska	shall
50	jag	I
01 Block 8	då	then
30	$\varnothing_A$	*(I)*
40	hjälpa	help
60	till $\varnothing_O$	to *(I + with municipality + surely I+ about Y)*
70	med $\varnothing_O$	with *(I + with municipality + surely I+ about Y)*
01 Block 9	att	that
30	$\varnothing_A$	*(I)*
40	komma	finding
60	på $\varnothing_O$	out *(municipality + surely I + about Y)*
01 Block 10	hur	how
30	kommunen	municipality
40	ska	shall
50	$\varnothing_O$	*(municipality + I surely + about Y)*
01 Block 11	[att]	[that]
30	$\varnothing_A$	*(municipality)*
40	spara	safe
50	$\varnothing_O$	*(municipality + surely I + about Y)*
01 Block 12	[att]	[that]
30	$\varnothing_A$	*(municipality + surely I + about Y)*
40	skiter	don't care a damn
50	väl	surely
50	jag	I
60	i $\varnothing_O$	about *(Y)*
00	.	.

linkage becomes observable. A significant increasing stability is emerging through the last AaO unit of Table 7. After twisting, a transition to a new state, instability becomes evident. Table 8 marks the evolving process and the codes for its book-keeping.

Text building behaviour both contributes to and is constrained by the structural properties of the developing flow-fields. At the agent-side two textual agents are physically displaced. Then, through the introduction of a new textual agent, a stop appears at the border to Block 10. The flow, in its turn, is channelled into the ($\varnothing_A$) of Block 11. In Block 12, an integration takes place and the agent compound ('municipality + surely I + about Y') is moving into the ($\varnothing_O$) of Block 11. Stepwise forward and backward moves contribute to the channelling of flows through the flow-fields. This process continues up to a point where pendular transformation and channelling satisfy the requirement of "conservational closure".

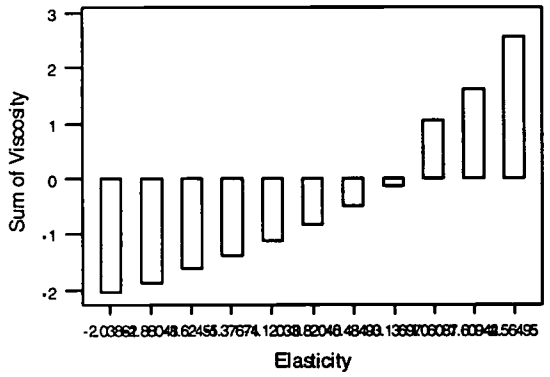
The strength of the physical displacement of both agents and objectives lies in the fact that the entire process reaches a steady state before a new twist of the whole configuration appears. Thus, the textual dynamics is of central import and more than an intuitive descriptive label. It is a well-defined concept.

Textual Dynamics

The muscular forces involved in the production of a verbal flow and the non-muscular forces that generate complex spatial patterning of the verbal flows. Its joining and linking operate of AaO's comes to an intermittent end with the emergence of a new period (.). Through this phase of processing, a number of diffused points have become manifest. For each micro region, a verbal flow (vf) vector (B. Bierschenk, 1993, p. 10) represents the rate of change in the elasticity of the evolving text. Figure 4 gives a summary of stress and strain potentials operating on the processed points. The first solid girder represents viscosity and elasticity of the first step taken in the processing. The Chart relates stress and strain in various source-sink relations to the operating flow. Involved in the flow of textual elements is a pressure potential (PP) that has been established by a double integration. This integration runs in Figure 4 clock-wise through Block four. With each transformational step, adjacent and successive ordering

Figure 4.

Viscosity and Elasticity in the AaO's



of value carrying strings provide for the topology of the textual micro regions. Transformational changes are dramatically increasing after Block 6. An ordered progression

in the timing of text building activities is suggested. Time has a decisive part in the determination of this work space. Its temporal evolution has a precise purpose and refers to system dynamics. For short periods, a system may behave nearly deterministically. As argued in B. Bierschenk (1993, pp. 9-10) the extension of a text is an expression of the work (w_{visc}) that has been invested by the text producer. By extracting the relevant points, it is possible to establish a manifold. Table 9 gives a summary of agglomerated viewpoints. The ESS-value is a suitable, dimensionless quantity that can be used in

Table 9.

Manifold of Textual Viewpoints: Sluggishness

Matrix No. 1	Swedish	English
Cluster 1	**Objective**	
No. 1	idag	today
No. 2	ju inte bara	you know not only
No. 3	de flesta ju	the majority you know
No. 4	ju	you know
No. 7	kommunen väl jag i Y	municipality surely I about Y
No. 8	väl jag i Y	surely I about Y
Matrix No. 2		
Cluster 1	**Agent**	
No. 1	inställningen	the attitude
No. 2	inställningen + idag	the attitude + today
No. 3	X	X
No. 4	de flesta	the majority
No. 6	kommunen	the municipality
No. 7	kommunen + väl jag i Y	the municipality + surely I about Y

characterising observed pattern co-ordination. Successive trials of clustering show that the loss of information in each cycle is (ESS = 1.00). The set of viewpoints share a number of properties. Their major characteristic is their singularity. How close the single points are in relation to each other, depends on their affinity relation to the participating agents. Aggregation over the agents means a convergence on the viewpoints on a certain ESS-value. A check on the ESS-value shows that its magnitude is (ESS = 5.00). This means that their scalar value is (ESS = 1.00). In the beginning, each point constitutes its own cluster. Agglomerating these clusters implies the establishment of their point attractor on a region near the adiabatic invariant.

In the course of processing the manifestation of the textual agents of Table 9 is guided primarily by the intention of perspectivating certain perceived circumstances. The cluster name of Table 9 is an apposite of the fact that the kinetic attractor state of the A-component is describable through the pattern of their viewpoints of the objective part. The kinematic flow field property by which it is specified is an abstract description of the underlying mix of intentions. Thus, structural significance depends on the kinematic and geometric properties of the cluster. Hence, its strength is definable over its relation to some other cluster. Successive cycling through step 5 and step 6 produces a new collective. The strings assembled in Table 10 constitute this time a twofold. Table 10 contains viewpoints that are fluctuating near zero. This cluster has the value (ESS = 0.00). Fluctuations in the co-ordination of Cluster 1 with Cluster 2 are

carrying signs of instability. A bifurcation to limit cycle behaviour is therefore a possible outcome. Closeness of the point attractors of these clusters to the state attractor is determined by the Agent function, that is the textual agents of Table 9 and Table 10.

Table 10.

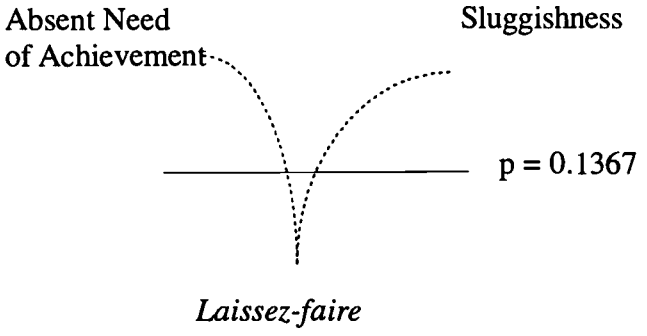
Fluctuation Producing Textual Viewpoints: Absent Need of Achievement

Matrix No. 1	Swedish	English
Cluster 2	**Objective**	
No. 5	ju min lön	you know my salary
No. 6	jag	I
Matrix No. 2		
Cluster 2	**Agent**	
No. 5	jag	I

The kinetic processes governed by the textual agent of Table 10 are generating kinematic flow field properties that are prototypical of this agent cluster. A check on the ESS-value of the bifurcation region shows that its magnitude is (ESS = 6.75). It follows that these two point attractors identify a higher-order function that plays back as a constraint on those kinetic processes that made this circular specification possible. Circular causal process are self-assembling the information needed for specification. Further, abrupt change in an ESS-value is indicative of the attractors that initiate and control the bifurcations into limit cycle attractors. Moreover, they lead the system through these states without any prescription or code that provides for the emergence of pattern and pattern dynamics. Figure 5 gives a summary of the specified constraints, controlling movement in the language space. An increase in configurational order can

Figure 5.

Hopf-Bifurcation of Figure Component

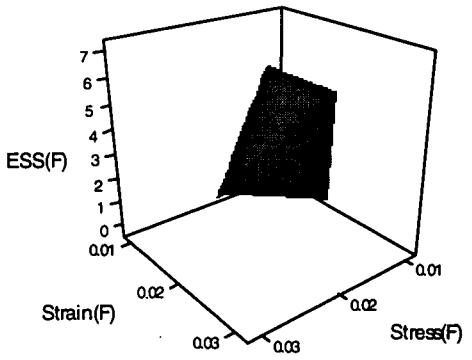


be observed. Typical of the Chart of Figure 4 is that it contains the verbal flow, that carries the information about the system's stable dynamical tendencies. In contrast, typical of Figure 5 is the invariant specification of its kinetic attractors and Figure 6 shows the depth of its tongue. They carry the prototypical information of clustered strings containing the viewpoints. This condition allows for a verbal description of sin-

gular points. Hence, the collective system variables are defined in the same work space as the cluster pattern itself. An abrupt change in the ESS-value is indicative of an inward directed space and the distance at which the singularity is located. The invariant specification of a kinetic attractor is revealed over the transformational steps. Stable and reproducible displacements have produced a state attractor. This is the attractor of its non-potential flow-field gradient.

Figure 6.

Holophor of the Figure Component



To characterise completely the indignation expressed by the text producer requires the manifestation of his reason as reflected in the Ground component. Table 10 contains the strings relating his standpoints, while Table 11 gives the textual agents.

Table 11.

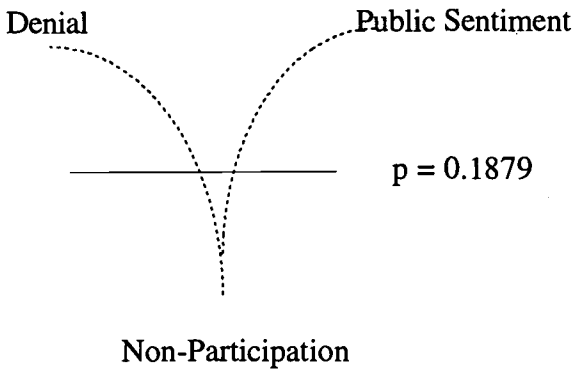
Manifold: Public Sentiment and Twofold: Denial

Matrix No. 3	Swedish	English
Cluster 1	**Objective**	
No. 1	på inställningen idag	at attitude today
No. 2	bland de kommunalt	among the municipally
No. 5	i Y	about Y
Cluster 2		
No. 3	till jag kommunen väl jag i Y	to I municipality surely I about Y
No.4	på kommunen väl jag i Y	out municipality surely I about Y
Matrix No. 3	Swedish	English
Cluster 1	**Agent**	
No. 1	X	X
No. 2	på inställningen + idag	at attitude + today
No. 4	kommunen + väl jag + i Y	municipality + surely I + about Y
Cluster 2		
No. 3	jag	I

Standpoints are in contrast to viewpoints more widely diffused and have a different time scale. In the process of extraction is the ESS-value (ESS = 1.00) critical. Values above this breakpoint provide for a precise measure of the location of the point and state attractors in the workspace. In a discourse, the standpoints are specifying an anchorage. In the particular case of the present analysis, it is the direction of looking. Standpoints are spread out as the Figure component of the text takes form. Depending on the producer's need for relating his Figure to a Ground, he is moving toward a point where he is forced to state a reason. Figure 7 shows how the Figure component

Figure 7.

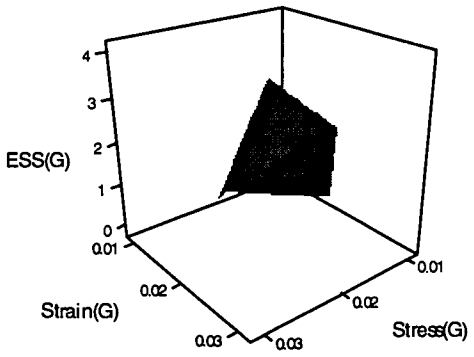
Hopf-Bifurcation of Ground Component



is related to experience and Figure 8 gives the depth of the Ground. The rate in disposing standpoints determines if it may be possible to detect the coexistence of an attractor that specifies the direction taken in text building. What kind of special importance it has in the empirical context becomes obvious as a result of the multifunctional proper-

Figure 8.

Holophor of the Ground Component



ties of textual strings. The stability of the evolving response surface is perceptible in Figure 8. The state attractor of Figure 8 concerns the Ground.

Thus the given compound of strings has the double function of indicating direction in the course of experience and a possible means of controlling work behaviour. Finally, the Means Component has also been realised, and thus gives expression to a prolonged action. When the text producer mentions a pointer to an aid point like ('with (I + with municipality + surely I about Y)) this should be regarded as an indication of an implicit instrument.

As the demonstrated example of text building shows, the information is at the beginning relatively sparse and implicit. Though in the course of development, text building becomes more elaborated. More and more relational properties let the ecological significance of the text become apparent. Evidently, the overall impression is that spacing and timing is different with respect to the Figure- and Ground-components.

A double set of conditions seems to control the language space at the kinetic level. One set is governing the dynamics of the standpoints and the other is controlling the development of the viewpoints. But more important is the topological nature of these points. They reflect a sensible orientation in the observation of the governing local opinion. This opinion constrains the manager's scope of action. The agglomeration of viewpoints into a manifold builds on the elastic channelling of textual material.

Verbal descriptions are of communicative import and Figures 5 and 7 identify these descriptions for both the Figure- and Ground-component. By naming these variables, dynamical states of language as systems are specified. It is important to note that a change in some mechanical parameter, such as length, has initiated a change in the work space. A bifurcation occurs and the process of transformation results in a limit cycle. A phase transition of this kind is called a Hopf bifurcation. Discovery of such a bifurcation is identical with the discovery of an order parameter. Its naming corresponds to naming the pattern itself. But more than that is involved. Its naming gives expression to its specificity that is meaningful to the psychological function or task.

Discussion

Logical positivism has put unreasonable pressure on psychology in general and the study of perception and learning in particular. Its source has been the assumption that knowledge can be represented as self-evident classes of sentences in a formally clarified language. Hence classification has been conceived of as the most fundamental of all operations. Moreover, in the formal sciences algorithms have been designed that can perform a variety of sorting operations. It should be obvious from the discussion in the present report, that psychology, in order to achieve the status of Science, requires a totally new approach to the treatment of the agent. Instead of dealing with the agent as unrelated objective referent in symmetric physical, symbolic, or conceptual relations, the leading idea of the present work is that the ability to gain knowledge must be understood in term of an intentional act. Thus, the lowest common denominator of self is the asymmetric affinity relation between the agent and objective of its action. Residing in the same mechanism, agent and objective participate in a circular causality relation.

In the work, it is shown that the individual agent is a reproductively integrated component of the AaO mechanism. The agent is always a composite whole. In a technical sense, an individual textual agent is treated as functional unit. This means that strings of graphemes give rise to units of varied complexity. Further, their functional diversification is the source of dynamic pendular and clock-like movements. When these movements occur during the process of text building, something novel comes into existence.

An agent is a single component, definitely located in space and time. It takes as its values textual agents which are integrated and joined through affinity forces. Any agent is restrained to stricture when and where it will occur. These are forced upon the agent as a result of thermodynamic processes, operating within the spatio-temporal nexus of the AaO unity. During evolution, the agents become terminated and specified in a tree of affinities and consequently topologically located as species. Successions of species with cumulatively developing variations have led to a proliferation of liking that corresponds to the branches in the cluster tree. At the end of the discourse, all strings participating in the clustering, have formed a single, recognisable and thus knowable unity.

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