

The Discursive Dynamic of Sensemaking

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Introduction

According to the traditional way of thinking of the communication process (more generally: of the discursive dynamic), actors exchange ready-made meanings. In other words, communication entails pre-defined semiotic devices, resulting from previous stipulation. Therefore, intersubjectivity is based on a repertoire of shared meanings, pre-existent to the social exchange. To underline the quality of product of a meta-stipulation, we refer below to this general model of communication with the label: *contractual model*.

The socio-constructivist model of communication (below we use this label in a broad sense) proposes a different way of looking at intersubjectivity. This way underlines that meaning is a social construction that happens *within* and *by* the social exchange. Hence, meaning is not given prior to the discourse; rather, it is the communication dynamic that depicts the situated semantic value of the symbolic devices which the discourse unfolds (Vygotsky, 1934; Bruner 1990; Billig, 1996). The socio-constructivist conception is an alternative way of seeing meaning-making that reaps Wittgenstein's lesson (Wittgenstein, 1953). This approach underlines that meaning-making is not an autonomous process, but it always unfolds as a function of the social context. According to this point of view, the socio-constructivist model underlines that meaning devices (concepts, categories, codes, signs, scripts...) are not given and fixed entities - for this reason universal and independent of time – but *open signs*, that shape their significance in situation, according to the way the actors use them within the linguistic games they carry out.

On the one hand, the dialogic construction of meaning is accomplished at the level of the *communication content*. At this level, discursive actors regulate their reciprocal positioning in the shared activity; by so doing they negotiate some kind of agreement on sets of representation, stories and statements referring to the world they share. Thus, these sets of consensual social-made meanings work as *instituted* mediators of the social exchange (Berger & Luchmann, 1966). To give just one reference, a lot of studies on social representations deal with this level of significance (Farr & Moscovici, 1984; Jodelet, 1989). On the other hand, the discourse process operates in such a way that it entails continuous transformation of the semiotic devices. At this level, the focus is on the *structure* of the devices. Valsiner (2001) deals with this structural level (as we have labelled it) when he speaks about the *semiogenetics* of the sign.

The present view is *semiogenetic* – signs are seen as emerging from the field of communication (...). Once emerged, the signs continue to differentiate and become hierarchically integrated in accordance with the general orthogenetic principle (Werner & Kaplan, 1956)" (Valsiner, 2001, p. 86).

In short, people use signs in order to reach some kind of consensual statements on the world they inhabit; in doing so they re-define continuously and recursively the semiotic value (that is, the domain of significance) of the signs. In this perspective, while it is true that the significances (concepts, systems of values, conceptions of the life, structures of knowledge, rituals, models of practices...) ground, steer and shape discourse – hence the actors' mind (Edwards & Potter, 1992; Salvatore, Ligorio & De Franchis, 2005) – at the same time it is true that significances are subjected to an endless work of shaping. This leads to seeing thought as inseparable from socio-communication context (Cole, 1996; Valsiner & van der Veer, 2000)

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The socio-constructivist model is a way of looking at communication among human beings that is far removed from common sense, because it regards semiotic devices not only as the given basis of the dialogical process, but also as the outcome of such a process. This way of seeing permits the logical paradox that arises with the contractual model to be avoided. The following question can highlight this paradox: if the dialogue needs to base itself on pre-defined semiotic devices, how have those devices been made? The fact is that the contractual model assumes as premise what it aims to explain. Nevertheless, the socio-constructivist model has another, no less difficult problem to solve. In fact, it has to elaborate a valid description of the dialogical process of meaning construction (both at content and structural level). In other words, the general theoretical principle of the social nature of sensemaking needs to be followed by an analytical model of *how* this happens. In the final analysis, the problem is to model the discourse dynamic that generates the semiotic devices that at the same time it unfolds.

Aim and general hypothesis

The aim of this article is to propose and to submit to initial testing a model of the discursive generation of meaning. Our thesis involves both a theoretical model and an empirical system of analysis. As a matter of fact, this thesis is a conceptual way of describing the meaning-making process translatable in an operative procedure of analysis. That allows the empirical description of the phenomenon, then the production of data to test the fitness of the conceptual model. Last but not least, this quality of the model is the premise for its formalization. This work does not deal with the mathematical formalization of the model, that we intend to develop in a subsequent paper. However the elaboration of a formal version of our model is the goal. We believe formalization has great importance in the field of semiotic analysis of discursive dynamic, not so much as a technical provision, but as a heuristic device that helps to focus on the logical ties among the components of the theory. Besides, formalization makes case study findings comparable with each other; for this reason, it increases the opportunity for accumulation of knowledge (Molenaar, Valsiner, 2005; Valsiner, in press).

Conceptual premises: Significance and sense, indeterminacy and hypersemia

Our hypothesis rests on some conceptual premises.

1. We share the cultural psychology idea that social practices are mediated by symbolic devices, available in the cultural environment. Such mediators can be seen as signs: a state/thing of the world (an object, a word, an image, an event...) which, thanks to a given cultural connection with a content (significance), acquires the property of representing (of being in place of, hence, of being significant of) such content (Eco, 1975). From that perspective, signs are the fundamental elements of the human world: they shape human activities, the discourse processes regulating them, the ways of thinking and of communicating carried out by the subjects.
2. Symbolic mediators working in the environment are not ready-made tools, taken for granted and for this reason ready-to-use (Gergen, 1999). Rather, each of them should be seen as a *meaning-making potentiality*: a *significant* corresponding with a continuous spectrum of *significances*, rather than with a discrete, fixed and unique significance. In other words, signs are open, polysemic, flexible and they fix themselves in the terms of how they are used in the communication context.
3. Jakobson's distinction between paradigmatic and syntagmatic axis (Jakobson, 1963) allows us to identify (and to differentiate) two fundamental sources of the sign's semantic indeterminacy. On the paradigmatic side we find the indeterminacy reflecting the weakness of the inner sign's structure; that is, the non univocal linkage between significant and significance. In short, this property means that the discourse often employs significant each

of which corresponds to various significances, and vice versa¹. On the syntagmatic axis we find the indeterminacy that follows from the impossibility of univocally constraining the interpretation of the signs' combination from within the combination itself².

4. This double source of indeterminacy has led to the recognition of the openness of speech, and more generally of communication, hence the inferential nature of decoding (*inter alia*, see Johnson Laird, 1983; Bruner, 1986; Neisser, 1987). Otherwise, both these two types of indeterminacy belong to a single linguistic conception of meaning, but discourse practices are not limited to the linguistic dimension. When a subject activates a sign (a combination of signs) within a communication field, in *so doing* he is performing a social act at the same time. The communication function of such an act constitutes the *value* that the sign gains for the actors involved in that communication field³. After all, this value is the *sense* that the sign accomplishes according to its way the discourse unfolds. Our point of view, then, entails a distinction between *significance* and *sense*: the significance is the semantic content of the sign (what the sign says about a given reference); the sense is the psychological-communicational value associated with the act of having produced just that sign, just in that intersubjective context, just under those discursive circumstances⁴.
5. Hence, the sense does not belong to the sign, but to the act of using it in the discursive context. A fundamental consequence follows from this: every sign *by definition* is a vector of infinite possibilities of sense, as infinite as are the discursive contexts. This means that the same word, the same sentence, can be used (hence, interpreted) with endless senses. So we conclude that from the point of view of the sense, the sign is *hypersemic*. With this term we mean the sign's capacity to be used in infinite modes. In a complementary way, we can say that hypersemia is the sign's property of defining its semiotic value only within - and as a function of - the discursive context.
6. In some recent works, one of us, with others, proposed defining the unconscious as the hypersemic power of signs, thus as the discourse property of being able to develop infinite possibilities of connections with other signs, hence of sense-making (Salvatore, Freda *et al*, 2003; Salvatore, Ligorio, 2003; Salvatore, Ligorio & De Franchis, 2005). This thesis is based on a semiotic, socio-constructivist re-reading of the Freudian theory, made by contemporary psychoanalysis, more specifically, the psychoanalytic line of thought that has elaborated a contextual and relational model of the mind (Modell, 1984; Mitchell, 1988; Schafer, R. 1992, Storolow, Atwood & Brandchaft, 1994 Hoffmann, 1998). Such a re-reading replaces the structural model of the unconscious with a conceptualisation that depicts it as a *process of affective semiosis*⁵: an intersubjective mode of constructing the sense of the relationship, by applying emotional (affective) categories. Such categories are different from the significances used by normative/paradigmatic thought as they are polysemic and homogenising classes of meaning (Matte Blanco, 1975; Rayner, 1995) that connote the communication contexts in a global and generalizing way (for instance, in terms

¹. For instance, the word: "to get" is a significant corresponding to a lot of different significances. Otherwise, significant like "utterance" "sentence", "phrase" refer to the same significance domain.

². For instance, consider the combination of signs corresponding with the sentence: "Mary is going to Alice's wedding. She believes she will like the present". From the inside of the sentences one can not understand *who* Mary believes will like the present: both Mary and Alice are the candidate. Otherwise, the reader will interpret the sentences as Mary believing that Alice would like the present that Mary is giving her. But to understand that the reader has to refer not only to the sentence, but also to his knowledge of cultural context (the social practice of taking a present to the spouses) (Sanford 1987).

³ Very useful here is Austin's distinction between *phatic* and *rhetic* act (Austin 1962), . The *phatic act* is the action of uttering a combination of linguistic signs; the *rhetic act* is the action of using this utterance to tell someone something.

⁴. We can refer to Austin, to his distinction between *meaning* and *force* (Austin, 1963). In particular, what we have called "psychological-communicational value" is close to Austin's concept of illocutory force: what people do *in* and/or *with* saying what they say.

⁵ Really, this processual (instead of structural) conceptualisation is typical of the first period of Freudian theorization (Freud, 1899). In particular, see the Freudian theory of primary process, as the way of working of the unconscious.

of *friend* vs. *enemy*). Developing such a perspective, one can come to see the signs' hypersemia as the reflection of the signs' property of conveying affective semiosis (since affective semiosis is the sensemaking process based on classes of emotional meanings). Thus, insofar as one agrees with the contemporary psychoanalytic definition of the unconscious in terms of this property, one is led to interpret the unconscious as the hypersemic property of the sign⁶.

With these general ideas as background, we can now put forward our model. We will present it in two steps: firstly, in a general theoretical format; then, we will introduce some further concepts in order to translate the qualitative model into an operative one.

General thesis: Sensemaking as sculpting

Let us imagine a virtual condition: the very first moment of the beginning of a discursive dynamic among actors who have never been in contact before (i.e., actors who are absolute strangers⁷). Let us consider now the first sign put forward by the actors. It would not have a defined sense yet; rather, it would have maximum hypersemia; that is, it would be open to infinite possibilities of sensemaking (depending on what other signs follow it). In other words, the maximum hypersemia is the initial state of the discourse, that of a boundless field of communication (discourse time t_0).

To give an example, let's imagine a person meeting other people (never met before) for a work matter. He arrives at the briefing and says to the unknown people present: "Good morning". Then, turning his gaze outside the window, adds: "What a beautiful morning!". At first analysis we can note that the significance of this sentence is not easy to determine: it expresses a positive evaluation (beautiful) of an unspecified reference. Nevertheless, the briefing participants will be able to reduce this indeterminacy, by the help of contextual markers. For example, the direction of the speaker's gaze, the state of the weather and the quality of the outside landscape might lead them to understand that the speaker was referring to the climatic conditions. Thus, once they have specified the reference, they would have no difficulty decoding the significance of the sentence. In sum, at first the sentence appears with an indeterminate significance; this indeterminacy is not absolute, but circumscribed to a set of different decoding paths. The question is different as regards the sense. If the *significance* of the sentence has a certain degree of indeterminacy (though reducible by the reference to the context in which it is uttered), the act of making such an utterance in the presence of those listeners, at that moment, can have infinite *values of sense*. To recall some of them, it can be a way to communicate: |I am happy at this moment| or |I like my job| or |I am the one who is happy here|, or |I like to be here with you|, or, |I am angry to be here, wasting time with you, the time that I could enjoy in a very nice way| and so on. In sum, this utterance sets off a field of communication that can go on in a large number of directions; in other words, it could go on through infinite patterns of further sign combinations. That is what we mean by "hypersemia".

The discourse unfolding fosters the reduction of the hypersemia. Such a process goes on until just a few possibilities of meaning remain active: in other words, till a *frame of sense* has crystallized⁸.

⁶. To digress, this interpretation leads to conceiving the unconscious as a property of discourse (a propriety of the signs that discourse unfolds), rather than the individual mind. Thus, such a conceptualisation of the unconscious entails a radically socio-constructivist re-reading of the fundamental psychoanalytic notion (Salvatore, Freda, submitted)

⁷. Actors being perfect strangers is only a virtual idea. Actors always share some cultural mediator, due to their membership of a social environment (first of all, a linguistic code). Perfect 'strangeness' has to be considered as an asymptote, that can be drawn near but not reached.

⁸. In this work we will not look closely at the mechanism of hypersemia reduction, the subject of another article (Salvatore & Freda, submitted). In that work the authors suggest seeing hypersemia reduction as the consequence of the associative linkages among signs that arise from the discourse flow. These linkages bound the hypersemic charge of the signs. Thus, the hypersemic charge of the first sign is reduced by the fact that it is associated to the second sign and so on. After all, according to that hypothesis, the meaning emerges from the bounds that the discourse's metonymic structure imposes on its parts. However, the scope of the present work is to define and test the following more general thesis: a) the process of sensemaking occurs from the inside of the discourse dynamic, as an output of it; b) this process has some structural characteristics that can be described in an operative way.

This means that, once established, the frame of sense ties up the further direction of the actors' coding and decoding practices⁹.

Before ending the presentation of our model, we want to highlight an issue involved in it. From our point of view, the establishing of a frame of sense is the final result of a process of reduction of meaning, rather than the effect of a consensual assertion. Using an image, sensemaking works like sculpting, rather than painting: it shapes meaning by its way of *taking off* rather than *putting on*.

A model of the sensemaking process. Discourse as dynamic system

The model of the sensemaking process proposed above entails a conception of discourse as an *self-regulated system*. As matter of fact, we consider what we have called "frame of sense" above as a process that fulfils itself *from within* the dialogical dynamic, as a product of the discourse's own functioning, rather than as a consequence of an external intervention (in other words, as a consequence of a kind of meta-stipulation among the actors in the discourse about a set of assertions fixing the semiotic ground of the relationship). From this point of view, the frame of sense is the structure generated by the dynamic of functioning of the discourse; that is, the shape that the discourse's self-regulation gathers through time of its unfolding.

The considerations just made lead us to conceptualise the crystallization of the frame of sense as a phenomenon of *emergence*, consisting in a new organizational structure (a new kind of order) appearing in – and acting on – the dynamic of the system (in our case: the system of the discourse). However, the conceptualisation of the coagulation of the frame of sense as a structure's emergence from a dynamic environment brings up a theoretical and methodological problem: the general qualitative definition of "sense" entailed in our previous discussion (sense as the psychological-communicational value) loses in validity. As matter of fact, it is a way of talking about sensemaking from *outside* of the system; instead, we need a model of sensemaking from the inner point of view of the system (Maturana & Varela, 1980; Guerra, 2003; Valsiner, in press), that is, the point of view that fits with the assumption of the self-regulating quality of the discourse dynamic. For this reason, we propose the following definition of "(frame of) sense": *the bounded domain of the admitted combination of signs which makes up the field of possibilities of discourse evolution over time*. Hence, the frame of sense is the set of communication patterns (i.e. sign combinations) at discourse's disposal after the reduction of the hypersemia.

In the light of this definition, we can conceptualise the discursive dynamic of emergence of sense in the following way.

At the beginning, the discourse is in a chaotic state. This state corresponds to the hypersemic condition of the first sign produced by the actors at the (only virtual) very first moment of their encounter (the time t_0). According to previous considerations, this chaotic state is the unbounded domain of combination of signs, i.e. the infinite set that includes as its cases all the conceivable associations among all conceivable signs¹⁰. From the chaotic state, the dynamic of the system leads to the emergence of a structure of functioning, that can be represented, as we have already said, as the result of the activation of bounds on the domain of the admitted combinations among signs. By so doing, the system operates a differentiation between patterns of signs, dividing them into probable ones, possible ones, rare ones, non admissible ones.

⁹ For example, consider a group of friends engaged in a conversation. They are speaking ill of each other, but the frame of sense within which their interaction unfolds is well structured: [It's a joke], through which they can express their friendship. Given such frame of sense, if one of them said to the other: "You are very malicious, I don't want to hear you any more!", the listeners would interpret it as part of the joke, and would use the utterance as a further opportunity to carry on the game. In other words: the frame tends to bound the greatest number of paths of discourse that could follow the utterance (expression of excuses, mortification, emergence of aggressiveness, interruption of the conversation...).

¹⁰ Incidentally, this definition of hypersemia is very close to the formal definition of the unconscious proposed by Matte Blanco (1975).

In terms of dynamic system theory, such a domain can be described as an *attractor*: a region of the space of the system description¹¹ that holds the states of equilibrium towards which the system tends. From a complementary point of view, we can represent the emergence of the frame of sense referred to as the *slaving principle* (Haken, 1992). This principle comes from synergetic, a branch of dynamic system theory. It describes the system components that are subjected to (are enslaved to) an over-orderly principle of system functioning, generated by the system itself¹². The emergence of a frame of sense can be seen in such a way too: a structure (an order parameter in synergetic terms) to which the signs enslave their functioning (that is, the possibilities of their combination). This last consideration gives us the opportunity to focus more clearly on the objective of this article. Here we want to test an operative model pointing out the emergence of the frame of sense from within the discursive process. Obviously, testing this model is also a way of testing the theoretical thesis it derives from, which we can summarise as follows:

1. The discourse is performable as a dynamic system that self-regulates its functioning.
2. The discourse generates the frame of sense rooting the dialogical exchange from inside.
3. One can interpret the frame of sense as the precipitate of the reduction of a sign's hypersemia, the effect of the discourse unfolding, i.e. the activation of bounds on the domain of possibilities of sign combination.
4. This reduction is representable as a phenomenon of emergence, a typical property of self-regulating dynamic systems.

Method

Some assumptions as premises: the focus on verbal interaction

In order to represent operatively the emergence of sense from the discursive dynamic, we make some methodological assumptions that we want to clarify before going on.

First, we limit our analysis of discourse to interpersonal communication mediated by verbal language. We are well aware that conversation among people is just one of a wider spectrum of discourse forms (for instance, discourse processes mediated by mass media, by artistic products, by images; besides, the discourse practices embedded in acts, in rituals, in the forms of social participation, in the functioning of institutions, in consumer models, and so on). We make this choice because – given the model of analysis we have – the micro-social context is the one that best allows to depict the dynamic of sense emergence as a continuous process that unfolds through time. As a consequence of our methodological choice, we know that our conclusions cannot be generalized to other kinds of discourse, but they refer to the specific discursive phenomena they are derived from.

¹¹. The description space of the system (called “space of variables” too) is a geometrical way of representing the dynamic of the evolution of a system through time. One dimension of the space represents time. The other (or the other two) represents/represent a variable/two variables describing the characteristics of the state of the system in a synthetic way at a certain instant (t). Thus, every point of the space of description depicts one state of the system at a given instant.

¹². Haken explains the slaving principle by referring to the laser light.

“1. A system of individual active elements can become entirely ordered in its action by means of self-organization, i.e. the order is not imposed on the system from outside. Instead, the change of a rather unspecific control parameter (in the laser case it is the size of the electric current), induces a self-ordering of the system (in the present case the motion of the electrons).

2. The huge number of individual variables or degrees of freedom of the individual electrons in the case of a lamp, where all the electrons act independently of each other, is replaced by a single variable, namely the order parameter, i.e. the laser light wave. We thus see that the behaviour of a complex system may be governed by only a few variables, namely the order parameters.

3. The order parameters become apparent when a system changes its macroscopic behaviour qualitatively, i.e. for instance, at the transition from the microscopically chaotic emission of a lamp to the highly ordered emission of a laser.” (Haken, 1992, p. 36)

Second, we focus our gaze on just *one* dimension of the interpersonal communication text: verbal interaction. We thus leave the paralinguistic and non-verbal component out of our analysis. Besides, we operate a further selection: within the linguistic dimension of the interpersonal communication, we limit our analysis to its phatic sub-dimension (to use Austin's definition). In other terms, our method is not interested in the communicative behaviour of the sign as a whole, but only in one of its components: *the plan of the significant*. That means we pay no attention to other relevant components of the linguistic dimension of the discourse, the semantic contents of the signs, the syntax rules of their combination, their pragmatic effects. All these limitations directly reflect the method of analysis whose focus is on the shape of the lexical distribution¹³. Obviously, we know that such limitations bring with them a lack of information. However, any method implies that. Moreover, we believe that the lack of information is not so relevant, because of the redundancy between the different components carrying the communication.

On the basis of the assumptions just discussed, our method poses the following methodological hypothesis: *the sense can be represented in terms of the variability of the lexical significans the text is composed of*¹⁴. That hypothesis draws directly from the above conceptual definition of the sense as the domain of possibilities of sign combination. As a matter of fact, from an operative point of view, we can define sign combination as a pattern¹⁵ of distribution of word occurrences, each of them associated with a probability value.

For instance, let us consider a hypothetical combination of signs: *x, y, z* (say, *x* is for "interest", *y* for "friendship", *z* for "pleasure"; such a discursive combination of signs could depict a sense of happiness connected to a warm interpersonal experience). In operative terms, such a combination corresponds with the following pattern of the distribution of occurrences throughout the text:

- high rate of co-presence of *x, y, and z* in some segments of the discourse;
- low rate of presence of *x, y* or *z* alone;
- possibility of high rate of presence of other combination in the segments of text where *x, y* and *z* are absent.

In short, we propose to see the discourse as a *movement of significans*: the distribution of a word through time, with the structure of such a distribution (which words and when they occur) depicting the frame of sense.

The operative model: the description hyperspace of the dynamic of discourse meaning

Our methodological hypothesis justifies the adoption of an operative method of description of the discursive dynamic in terms of lexical variance throughout the text.

For the aim of analysing the lexical variance, the method adopts a statistical multidimensional technique of analysis (*Factorial Analysis of Lexical Correspondences*, FALC; Lancia, 2002). Generally speaking, FALC breaks up the whole lexical variability of the text into discrete units

¹³. Actually, this methodological choice reflects some limitations of the methods of analysis focusing on other components of the language, in particular on syntactic and semantic dimensions. A discussion of such limitations would go far beyond the scope of this article. Thus, we just want to highlight how syntactic analysis entails a normative criterion as reference, by means of which to evaluate the observed combination/distribution of the elements of the text. Instead, semantic analysis requires interpretative schemas by means of which to decode the signs. In short, in both cases, the analysis entails a previous model of knowledge, to apply to the text that reflects the cultural premises of the analyser.

¹⁴. A vast number of multidimensional techniques of text analysis share this assumption. These techniques have the purpose of identifying and analysing lexical variability and words' combinatory/oppositional behaviour, of which lexical variability is an expression (Lebart, Salem, & Berry, 1998; see also Salvatore, Grasso, & Tancredi, 2005)

¹⁵. Note that this pattern has to be understood as a dynamic one. In other words, it has to be represented as having a temporal dimension. Hence, the distribution has to reflect the redundancy of the sign combinations. For instance, a pattern of distribution composed of the signs α, β, χ with probability 0,4 means that throughout the text (thus, through time) signs α, β, χ tend to be present together and that such a trend concerns 40% of the total occurrences of such signs.

(namely factorial dimensions) each of them corresponding to the behaviour of one or more lexemes¹⁶.

What follows are the logical and operative steps of the FALC we have applied.

First, the analysis works on the verbatim transcription of a communication interaction¹⁷.

Second, the text is transformed in a digital matrix¹⁸. To do so, at first the text is broken up in segments (namely *Elementary Context Unit, ECU*), each of them corresponding to one of the whole amount of sentences the text is composed of. Each sentence represents a row of the matrix¹⁹. Then, FALC singles out all the lexical forms of the text and it subjects them to lemmatisation (cfr. Note 16). The lemmas obtained in this way become the columns of the matrix. Each cell of the matrix can assume one of a binary code: 1 for presence, 0 for absence. In this way, the matrix represents the distribution of presence/absence of the lemmas throughout the text: each cell (ij) shows whether in the sentence corresponding to row (i) the lemma corresponding to column (j) is present or not. In such a way, the matrix is a digital representation of the lexical variability of the text (cfr. Fig. 1).

Third, *Factorial Analysis of Multiple Correspondences* (FAMC) is applied to the matrix. Factors taken out by FAMC represent the units of lexical variability in which the text is broken up. Generally speaking, each of these dimensions can be seen as a meaning sub-component active in the text (insofar as it is associated to a quote of variability of the signs²⁰).

Forth, the FACM provides a description of the relation of each ECU-row with each factorial dimension, in terms of a factorial coordinate (i.e. an index of association between ECU and factor). In mathematical terms, each ECU can be represented as a vector having as many linear²¹ components as there are factorial dimensions. In geometric terms, the *n* factorial dimensions depict a *hyperspace* of *n* dimensions. Each ECU represents a point of this hyperspace, defined by the coordinates on factorial dimensions (i.e. the values of the vector).

In conclusion, on the basis of this geometrical interpretation, we adopt the factorial hyperspace produced by FACM as the *description (hyper)space of the meaning's discursive dynamic* (below: *description hyperspace*) (cfr. note 11). Each dimension of the description hyperspace represents an axial sub-component of the semiotic field that shapes the discourse meaning. Each point of the space (corresponding to the single ECU) represents the state of the meaning at a given instant of discourse time, as defined by the coordinates on the axial sub-components. Then, the line that links the points of the space corresponding to the states of the meaning through time draws the developmental trajectory of the unfolding of the discourse.

Figure 1. A digital matrix representing a text

	LEMMA 1	LEMMA 2	LEMMA 3	LEMMA n
ECU 1	0	1	0				
ECU 2	0	0	0				
ECU 3	0	0	1				
....							

¹⁶. Note that the FALC does not apply to the single lexical forms as they appear in the text. As a matter of fact, before applying FALC, each word is transformed into its lemma. Lemma is the word label that indicates the class of lexical forms, each of them produced as the class syntactic declination (Pottier,1974); for instance, the lexical forms “go”, “goes” “went” are transformed in the single lemma: “to go”. The lemmatisation brings a reduction of the lexical variability, functional to the FAMC.

¹⁷. More generally, the FALC works on a textual corpus. We apply FALC to the text of a novel in our study too (see below).

¹⁸ We carried out this and the further steps by means of the support of a specific software of text analysis: T-LAB (version PRO.XL1) (cfr. www.T-lab.it).

¹⁹. Note that the ranking of the row reflects the temporal sequence of the ECU. For this reason, the row of the matrix can be seen as representing the temporal dimension.

²⁰ Note how the FAMC can take out a very high number of factors (T-lab PRO.XL1 can get up to 500 factorial dimensions). So, the degree of inertia (i.e. variability) associated to each factorial dimension is very low (maximum 3-4%). For this reason we prefer to speak of meaning *sub*-component).

²¹. Keep in mind that the factorial dimensions are orthogonal among them.

...							
...							
ECU n							

This model makes possible to represent the concepts of our general thesis in operative terms. As we have already said, one can view hypersemia as the (virtual) beginning of the inbound domain of possibilities of combination among signs. Hence, hypersemia could correspond to *the maximum dispersion of the lexical variability throughout the factorial dimension*. In geometrical terms, that means one needs a description hyperspace with a huge number of dimensions to depict the dynamic of the discourse (in other words: its lexical variability). In complementary terms, this geometrical condition is depicted by a dispersive distribution of the inertia explained by factorial dimensions. In other words: in hypersemia each factor gives a minimum contribution to the statistical explanation of the whole inertia; moreover, if one prefers, to explain a given quote of this inertia more dimensional factors are needed (than in the absence of hypersemia)²².

In accordance with the same logic, the emergence of a frame of sense corresponds to an increase of the capacity of the factorial dimension to explain lexical variability (that is, the increase of the quote of inertia associated to any factorial dimension). In geometrical terms, such an increase entails a *reduction of the dimensionality of the description hyperspace*: fewer dimensions of description hyperspace are needed to draw the discourse dynamic.

Above we have said that the frame of sense emergence can be represented in terms of a process of slaving. Our operative model may describe such a process. To see how, we have to take into account that according to the synergetic theory, when an individual element of a behaviour system is enslaved to a group of other elements, its functioning becomes attuned to that of the others. This means that the individual element just keeps a specific pattern of functioning, giving up other patterns it expressed before being enslaved. In other words, when a slaving process happens, the enslaved element develops a bond with the pattern of system global behaviour and at the same time it loses the previous partial linkages with the other individual elements. Thus, in our case what happens could be described as something like a *form of specialization of the meaning's micro-components*. Now, within our model one can consider the single factor dimension as the individual element of the discourse's dynamic system. Hence, we reach the conclusion that the emergence of an enslaving process should be pointed out by *the reduction of the number of correlations between factorial dimensions*.

Operative Hypothesis

On the basis of the last consideration, we can now translate our general thesis on sensemaking as a dynamic of emergence into an operative hypothesis.

A. Given a verbatim transcript of the verbal content of an interpersonal communication and supposing that such interpersonal communication is as close as possible to the virtual model of discourse characterized by the starting condition (t_0) of reciprocal perfect 'strangeness' among actors²³, we hypothesize what follows.

²². To understand this issue it may be useful to remember that a factorial dimension corresponds to a pattern of presence/absence of certain signs. Hence, the more unique such a pattern is (that is, the sign components of the pattern occur only together), the higher the degree of lexical variability produced by them is covered by the corresponding factorial dimension. In contrast, the more hypersemic a sign is, (in other words, each sign of the pattern also occurs in association with signs other than the ones of the pattern), the lower the quote of that sign's lexical variability covered by the corresponding factorial dimension.

²³. Obviously, this condition involves actors who have never met before; but this condition is not enough. Perfect "strangeness" means a relationship between actors who do not share any kind of symbolic mediator.

(Hp1) A reduction of dimensionality of the description hyperspace through time (i.e. alongside the first time-segment of the discourse and the further segments)²⁴. This means that we expect that if we compare the first (in temporal order) segment of discourse and the following ones, the latter will show a bigger amount of inertia explained by the first factorial dimensions.

(Hp2) A decrease in the number of significant correlations among factorial dimensions through time. This means that we expect that if we compare the first (in temporal order) segments of discourse to the following ones, the latter will show a lower number of significant correlations among the factorial dimensions²⁵.

B. We also hypothesize that Hp1 and Hp2's findings are specific to the process of interactive communication. As a matter of fact, as we have already asserted, it is this kind of discourse that suits being modelled as a self-regulated dynamic system, as such characterized by emergence phenomena. Consequently, we expect that:

(Hp3) we will not find Hp1 and Hp2's findings in comparable analysis carried out on kinds of texts different from the verbatim transcripts of an interactive communication.

Procedure of analysis

Texts used as data

We have selected as a sample of discursive interaction the verbatim transcription in Italian of an expert psychotherapist carrying out successful cognitive psychotherapy with a young woman for four years²⁶. Psychotherapy represents a *sui generis* case of discursive interaction, holding all the following desired characteristics:

- it is an interpersonal exchange lasting quite as long time, in a documentable and representable way;
- it is a minimal communication structure, played just by one dyad, always made up of the same subjects;
- it is a social practice so one can identify a point of origin, the t_0 moment: the first instant of the first session;
- it is a micro-social context which is quite autonomous compared to the external contingences; it can therefore be seen as a self-regulating dynamic;
- it is an intersubjective transaction that can be tested by means of independent criteria (i.e. the clinical effectiveness); in this way one can check that it does have the properties of good communication presumed by our formal model²⁷

The Italian language transcript of the psychotherapy is composed of 124 sessions. Each session represents the verbatim transcription of a weekly one-hour psychotherapy session. All the sessions

²⁴. This hypothesis entails the discourse dynamic usually moving from the initial condition of almost-'strangeness' to a shared symbolic state among the actors. In other words, we assume that the communication among unknown actors implies the emergence of and atonement to symbolic codes, used as mediators of the dialogic exchange.

²⁵. The factor dimensions are in orthogonal relation. Nevertheless, in our analysis the computation of the correlation rate is applied at a subgroup of the rows of the matrix used for the computation of the FACL. This allows the possibility of correlation among factors.

²⁶. Process and outcome analysis of such psychotherapy (Case K) are presented in Dimaggio (Dimaggio, Fiore et al., in press), and in other articles, some of them collected in Nicolò, Salvatore (in press). We want to thank the psychotherapist (dr. Giancarlo Dimaggio) and the III Centro di Psicoterapia Cognitiva di Roma (III Center of Cognitive Psychotherapy, Rome) that have put the transcript of the psychotherapy at our disposal.

²⁷. In other terms, we assume that successful psychotherapy entails the meaning emergence process that we want to model.

are of a similar textual length. The whole text is composed of 738.017 occurrences, corresponding to 22696 lexical forms²⁸, distributing in 16702 ECUs.

We have used as a *sample of interactive text* an classical Italian novel (*The Betrothed*, by Alessandro Manzoni, last version published in 1840). We have chosen this novel because it is very well-known and easy to find in electronic format; besides, it is a good sample of classical Italian language style. The novel is composed of 38 chapters of quite similar length. The whole text counts 218.402 occurrences, corresponding to 20188 lexical forms, distributing in 4812 ECUs.

For both texts, we have selected 4 three-session blocks (cfr. Tab. 1):

- ❑ the first 3 sessions,
- ❑ the first 3 sessions of the second decile ranked sessions;
- ❑ the middle 3 sessions;
- ❑ the last 3 sessions of the ninth decile sessions²⁹.

		Block 1	Block 2	Block 3	Block 4
Psychotherapy	<i>Sessions:</i>	1-3	13-15	60-62	110-112
Novel	<i>Chapter</i>	1-3	4-6	18-20	33-35

Analysis

We have subjected both text to two different kinds of analysis:

1. Study of the inertia associated to the factorial dimensions
2. Computation of the significant correlation among the factorial dimensions

1. Study of the inertia associated to the factorial dimensions

We have applied the AFCL procedure (see above) to each of the 8 blocks (4 of psychotherapy text and 4 of novel text).

To assure the comparability among blocks, we have used the same procedure for building the digital matrix from the original text. To this end, we have implemented T-Lab software (version PRO.XL1). To break up the text in segments (Ecu, the row of the digital matrix) T-Lab adopts a double criterion: the length of the segment (max 400 characters) and the presence of punctuation marks³⁰. The combination of these two criteria usually enables T-Lab's segmentation procedure to generate ECUs that are quite similar to the sentences of the original text.

The definition of the words to put under analysis (that is, the analysed forms constituting the columns of the matrix) is the output of two operations. First, T-Lab operates the lemmatisation³¹.

²⁸. Obviously, the same lexical form can occur various times in the text.

²⁹. We have left out the last sessions because (particularly in the case of psychotherapy) it could be very specific – and therefore non comparable with others. That could be because of the intervention of the termination/separation issue. We have hypothesized that the representation of imminent conclusion generates disorganization in the accomplished discourse order, thus a weakening of the frame of sense (in other words: a burst of hypersemia). This hypothesis finds confirmation in our other data (cfr Appendix, Tab. A1): the last 3-session block shows similar trends to the first blocks .

³⁰. More specifically, T-Lab defines the end of an ECU and starts with the following:

1. everytime it encounters a full stop marking a new paragraph; if not
2. after the 200th character, when it encounters another kind of punctuation (the search follows a hierarchical procedure; i.e., first of all it looks for exclamation and question marks, then it looks for a semicolon or a colon, then for a comma); if not
3. at the word following the word where the 400th character falls (equivalent to an average of about 30 words). (Lancia, 2005)

³¹. The T-Lab has a own dictionary containing the main lemmas of the Italian language (170.944 forms corresponding to about 21.000 lemmas, selected by the means of frequency dictionaries). For each lemma the dictionary has practically all the different declinations that are connected to it. We have integrated this dictionary with another,

The function of this operation is to class each lexical form in its syntactic category (that is: the lemma). Second, T-Lab defines a threshold for the selections of the lexical forms to submit to the subsequent analysis. T-Lab computes automatically an optimal frequency threshold, covering the whole distribution of the lexical form in the text³². We have slightly varied the T-Lab threshold (1 unit higher or lower than that of the T-lab, cfr. Tab. 2), in order to assure the same number of lemmas in analysis (206). As a matter of fact, this condition makes it easier to interpret the comparison between the block's inertia distributions³³. Lemmas with higher frequency than the threshold are used as columns of the matrix.

Table 2 reports the main income and output parameters of each of the 8 analysed blocks. For each block's matrix we have calculated:

- 1a) the distribution of the inertia among the 205 (number of lemmas in analysis less 1) factorial dimension.
- 1b) the number of factors corresponding to 10, 30 and 50% of explained inertia.

	Psychotherapy				Novel			
	Block1	Block 2	Block 3	Block 4	Block 1	Block 2	Block 3	Block 4
<i>N. of occurrences</i>	23698	11926	15734	17837	15862	15171	14909	18921
<i>N. of lexical forms</i>	3245	2117	2396	2502	4117	3874	3613	4241
<i>Total N of lemmas</i>	2174	1408	1597	1685	2815	2639	2455	2836
<i>N. of lemmas selected for the analysis</i>	206	206	206	206	198	198	198	198
<i>N. of ECUs</i>	1033	557	274	326	373	367	328	421
<i>Frequency used as threshold</i>	7	4	4	5	6	6	6	7
<i>Lemmas over threshold omitted</i>	1	18	13	35	10	14	11	4
<i>N. of Factorial dimensions</i>	205	205	205	205	197	197	197	197

2. Study of the significant correlations among the factorial dimensions

For each of the 8 blocks, we have selected the matrix of the factorial coordinates (obtained as output of the FALC) corresponding to the ECUs of the first session. Then, on this matrix, we have computed Pearson's rates of correlation among the factorial dimensions for each of these 8 samples³⁴. Then, we have used the number of significant rates of correlation among factorial dimensions ($p > .0,01$) as comparative criterion among blocks. We have also analysed the distribution of the significant correlation on the correlation matrix.

constructed by us on the basis of an analysis of a large textual corpus collected from a wide spectrum of textual sources (newspapers, novels, transcripts of verbal interactions, scientific essays).

³². To do this T-lab adopts a statistical criterion. It defines as threshold the frequency corresponding to the first or second decile (depending on the volume of the corpus) of the list of the lexical forms ranked by frequency. In other terms, T-Labs chooses as threshold the frequency in reference to which one selects 80 or 90% of the lexical forms.

³³. Note that to arrive at number of 206 lemmas in analysis, in the case of some blocks we have deselected few lemmas even if they had a frequency above the threshold. The deselected lemmas have been randomly chosen among the ones with the threshold frequency (cfr. Tab. 2).

³⁴. Remember that each ECU is defined by a set of coordinates, one for each factorial dimension. Besides, note that the matrix of factorial coordinates is the output of the FACL applied on the whole 4-session block. In other words, in so doing we have used the hyperspace of description corresponding to the 4-sessions text as context of analysis for the ECUs of the single session.

Results

Figure 2 compares the 4 distributions of explained inertia among the dimensional factors, each of them corresponding to one of the 4 analysed blocks of psychotherapy text. The distribution is depicted in terms of cumulative percentage.

As one can see, the distribution curve moves toward the left as time goes on (i.e. from the first to the other blocks, ranked as a temporal criterion). This means a progressive increase in the quote of inertia explained by the first ranked group of factors throughout the blocks of sessions. Besides, note that the main difference occurs between the first block (sessions 1-3, yellow line) and the others. The other blocks show very similar tendencies among them. In the case of the first block of sessions, the inertia spreads in a more diffusive way among the factors; in other words, the cumulative percentage increases less quickly than as it does in the case of the other blocks. Otherwise, the trend of the inertia to be concentrated on the first ranked factors does not follow a perfect linear temporal tendency. As matter of fact, the concentration increases from the first block (session 1-3, yellow line) to the second one (session 13-15, blue line), but the highest concentration is depicted by a middle block (block 60-62, red line).

If we take a look at the shape of the lines, we can observe that the difference between the first block and the others concerns the first 80-85 factorial dimensions. More precisely, the largest difference between block 1 and block 2 is on the 84nd factorial dimension (difference: 7,13 percentage points); the largest difference between block 1 and block 3 is on the 79nd factorial dimension (difference: 10,92 percentage points); the difference between block 1 and block 4 is on the 78nd factorial dimension (difference: 8,71 percentage points) (cfr tab A1-Appendix).

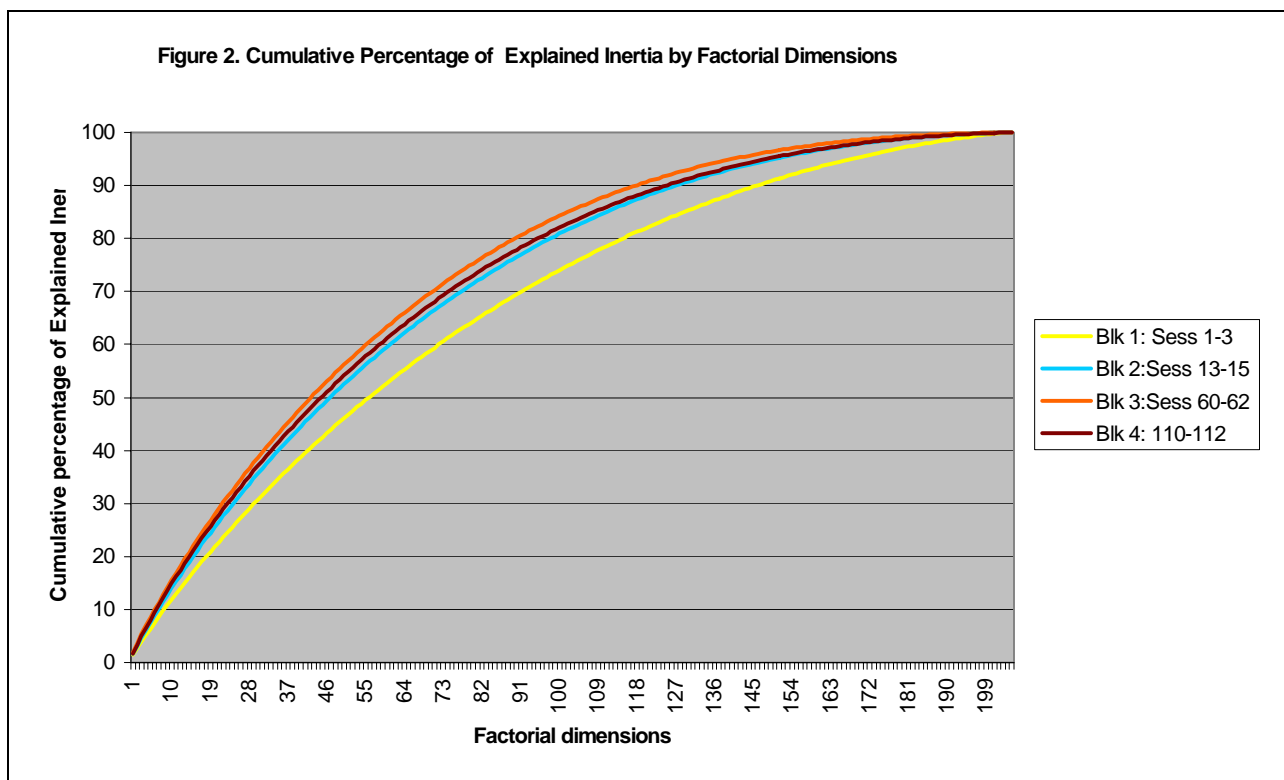


Figure 3 depicts the same trends from a complementary point of view. It shows the number of factorial dimensions corresponding to three different degrees of explained inertia (10%; 30%; 50%). As one can see, differences among blocks are not dramatic in the first 10% of inertia. But they increase if one take as reference the 30% level. The differences are still larger (only in absolute, but not in relative terms) in the case of the 50% level. Besides, one has to note that the difference concerns mainly the comparison between block 1 and block 2; between these blocks the number of

factors corresponding to 30% of inertia passes from 30 and 25; it passes from 56 to 47 in the case of 50% inertia. Instead, between the second and the other blocks the differences in the number of blocks are lower (respectively: 25 *versus* 22 and 23; 47 *versus* 43 and 45).

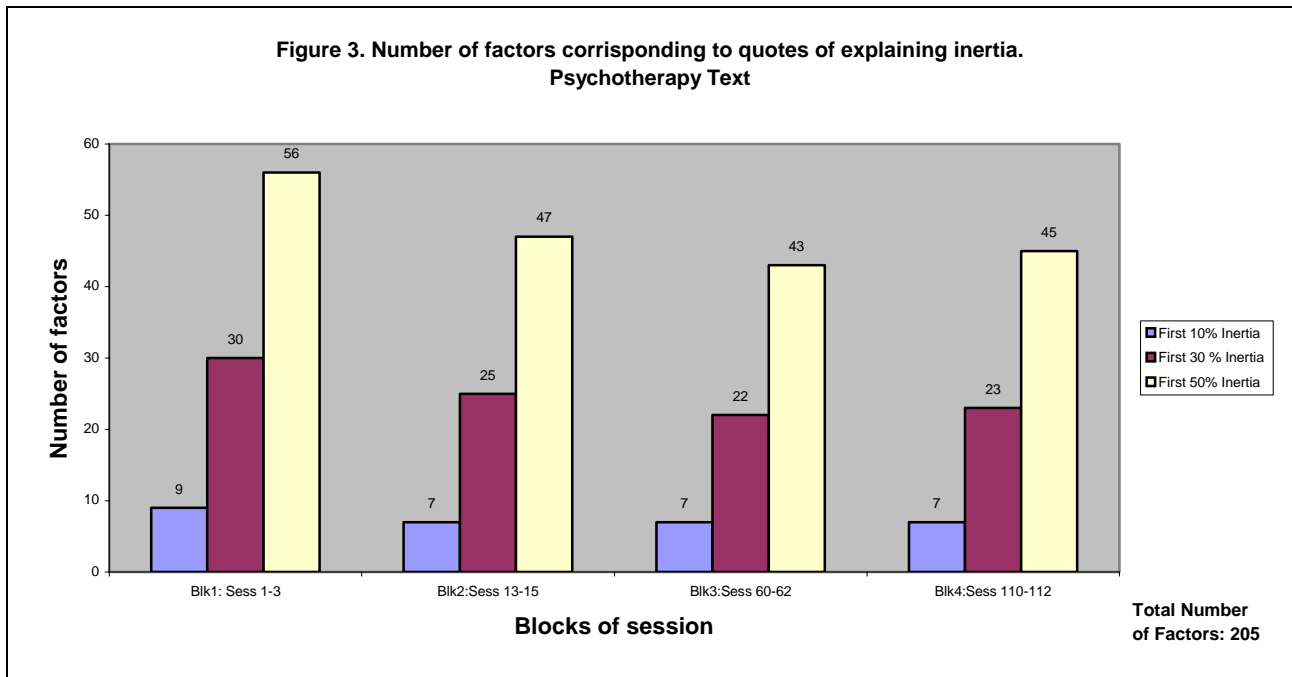


Figure 4 reports the corresponding findings related to the novel's 4 blocks. In this case the 4 lines are very close. In the case of the first three blocks (chapter 1-3; chapter 4-6; chapter 18-20) they are found to be overlapping. One can also note that in the case of the novel, there is no relation between the rank of the block and the position of the corresponding line on the Cartesian space. More particularly, as regards the concentration on the first group of factors, the increasing rank of the blocks is: in first position block 3 (chapter 18-20, orange line), followed by block 2 (chapter 4-6, blue line), then by block 1 (chapter 1-3, yellow line), with block 4 (chapter 33-35, brown line) in last position. Besides, one can observe an inversion between the two texts: in the case of the psychotherapy text the last block (the 4th one) shows the most concentrated distribution, while in the case of the novel text the last block shows the least concentrated one.

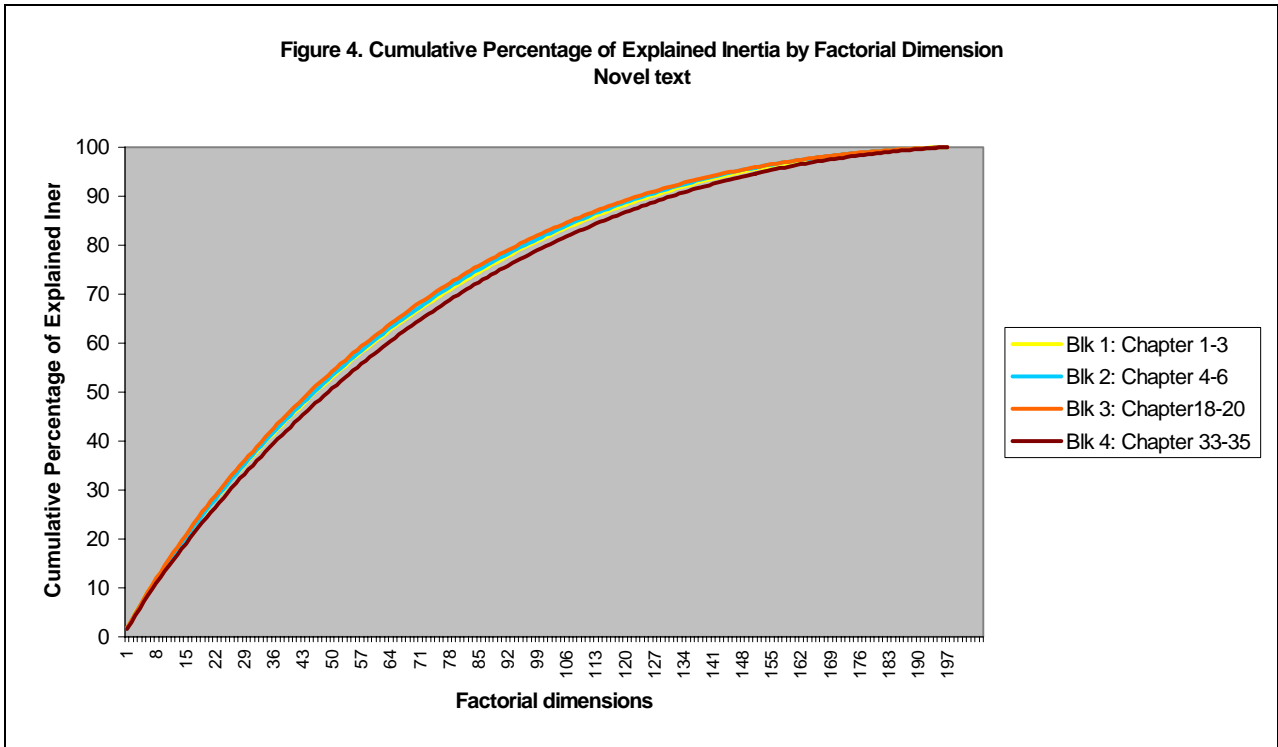


Figure 5 offers further data showing the substantial equivalence of the distributions of inertia corresponding to the four blocks of novel text. Among the blocks, the number of factors corresponding to the first two cut offs, (10% and 30% of explained inertia) is the same or almost the same (respectively 7-8 and 24-26 factors). Also in the case of the 50% cut off the differences remain low (range 45-49).

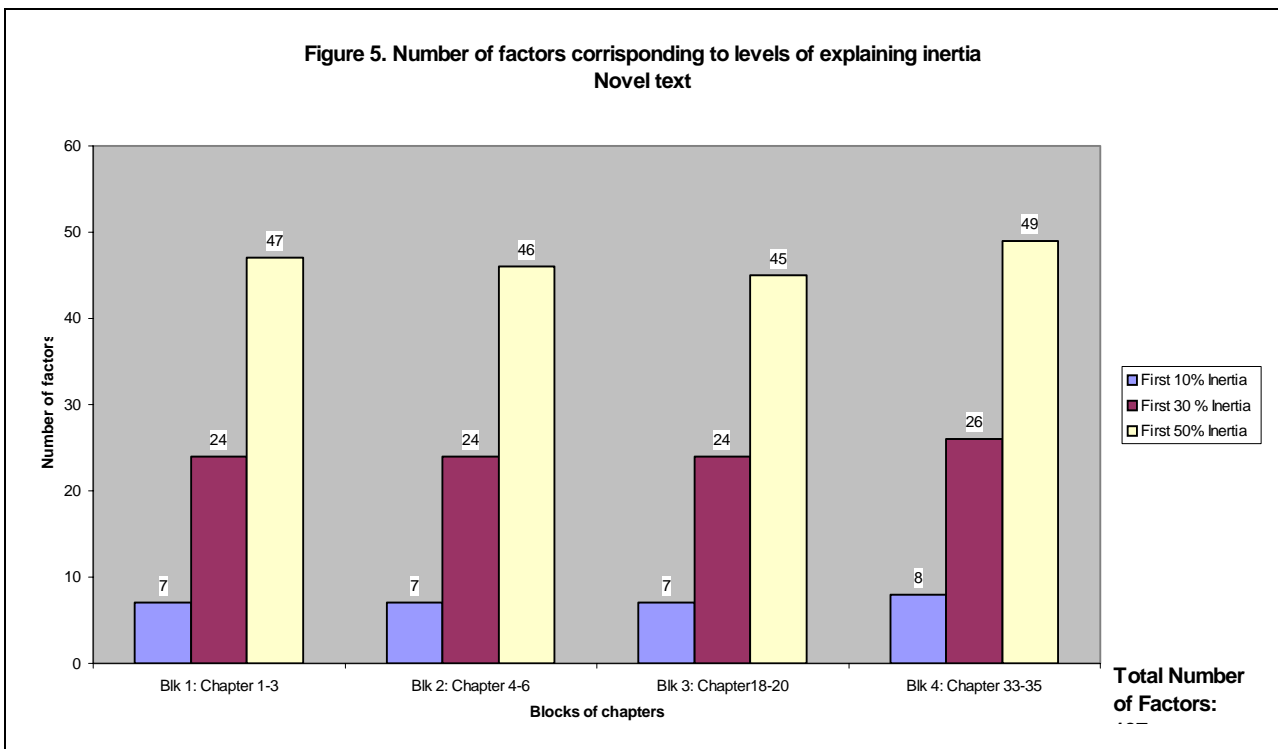


Figure 6 reports the percentage of significant correlations among factorial dimensions for each correlation matrix corresponding to any of the 8 analysed blocks. In accordance with the hypothesis that the enslaving process entails the strengthening of just some bounds and the corresponding

weakening of the linkages with other, more numerous elements, we have adopted a threshold of $p > .01$ as criterion of significance. Besides, the figure presents the data in percentage format (i.e. in terms of a ratio between the significant correlations and the total number of correlations among factorial dimensions³⁵).

As one can see, in the case of the novel text the percentage of significant correlation does not show a large difference among the blocks (range: 2,02%-2,32%); furthermore, the tendency is to an increase, though very slight, in the amount of significant correlation alongside the ranked blocks (from 2,02% of the block 1 to 2,32% of the block 4). The psychotherapy text's inter-block distribution is quite different. First, its tendency is towards a progressive decrease in the number of significant correlations alongside the ranked blocks (from block 1's 3,73% to block 3-4's 1,7%). Second, one can observe a quite dramatic difference between the first and the second block (corresponding to a decrease in the number of significant correlations of more than 38%: from 3,73 to 2,29). After such a dramatic decrease, the percentage remains on similar levels in the subsequent blocks. However, if one compares the percentage of the first and the last block, the decrease is more than 50% (from 3,73% to 1,7%).



Comments

The data just presented show a good coherence with our hypothesis. Comparing the blocks of text ranked by the temporal dimension, we have found *all* and *only* the expected results:

- a) the increase in the concentration of the inertia explained on the first group of the ranked factorial dimensions;
- b) the decrease in the number of significant correlations among the factorial dimensions;

³⁵. Total number of correlations is calculable as follows: Number of factorial dimension x (Number of factorial dimensions-1)/2

- c) the specificity of these two findings, that concern only the text corresponding to the discursive interaction (i.e. the psychotherapy transcript), but not the novel text.

Moreover, one is struck by the evidence that in both analyses (i.e. inertia distribution and significant correlations) the differences are fundamentally concentrated between the first and the other blocks of psychotherapy text. After block 1 – i.e., after the first temporal segment of the discourse dynamic corresponding to this block - all the analysed parameters became stable. This pattern is strongly coherent with two main properties characterizing the dynamic of frame of sense emergence: a) the emergence comes in the first temporal moment of the interaction, when the actors define the “rules of the game” of their intersubjective transaction; b) the emergence comes suddenly, as a discrete transition to a state of equilibrium, rather than as a continuous and incremental process of change.

As we have already noted, the outcome of the novel text’s analysis offers further support to our hypothesis on the dynamic and emergent character of the sensemaking. As a matter of fact, in the case of the novel, we have found just minimal differences – therefore conceivable as irrelevant fluctuation - among the blocks, both in the case of the inertia distribution analysis and in the case of the computation of significant correlations among the factorial dimensions. We are inclined to interpret this absence of difference among the temporally ranked blocks as the expression of the specificity of the structure of a written text. In fact, in the case of a written text like a novel, the frame of sense is already inherent to the text itself, as a pre-condition - and at the same time the criterion - of its interpretability. In other words, a written text is a *given* object that does not unfold over time; thus, it does not imply the process of sense emergence, simply because it already holds a structure of sense in itself³⁶.

With this latter consideration as background we can focus another interesting issue: in both analyses performed on the psychotherapy text, parameters of the blocks subsequent to the first one show a very similar trend to that of the novel text. Insofar as one assumes that the novel parameters’ trend reflects the already given structure of sense of that kind of text, the similarity between this trend and the psychotherapy trend (after block 1) is a further finding going to the direction of the description of the discourse in terms of a dynamic system; that is, in the direction of the idea that at first the interactive communication generates a structure of order working as a state of dynamic equilibrium becoming the self-regulating principle of system operation (Maturana & Varela, 1980; Haken, 1992). In sum, these findings allow us to depict the discourse dynamic as a process with an initial *instituting*³⁷ phase from which an equilibrium state (i. e. the frame of sense) emerges and stabilizes the further unfolding of the intersubjective exchange.

We decided do not introduce statistical tests of such difference, preferring to stay on a qualitative plane of analysis, because of the limitation of the amount of data, which does not allow reliable computation. However, this report has been designed as a first step, aimed more to present our theoretical thesis and to start up the analysis of the operative model deduced from it, than to produce conclusive assertions. Anyway, even if just on the basis of a qualitative overview, the synoptic of the shapes of the data obtained from the lexical analysis of the two texts leads us to think that the trends showed by the psychotherapy interaction dynamic are not casual but meaningful, worthy of being taken into consideration. At the same time, we are aware that the

³⁶. That is not in contradiction with the hermeneutic and dialectic conceptions of the relationship between text and reader proposed by contemporary semiotic theory (Eco, 1979). In fact, this conception concerns the process of reading, that is the interaction between the text and who is reading it, while our considerations focus on the text as such. Otherwise, the fact that the semiotic theory underlines the inferential, dynamic and co-constructive character of the reader’s interpretation implies in the final analysis that the text has already its own structure, in relation to which the dialectical process of decoding can develop (here the debate on the literary genres as psychological and hermeneutic frame of the dialectical relation between text and reader is pertinent; Bruner, 1986).

³⁷. The concept of an instituting phase has been examined in depth by Carli, in a series of works in Italian (Carli, 1987; Carli, Paniccchia, 2003; see also, in English : Paniccchia, 2003). From a complementary point of view, this concept refers to the conceptualisations proposed by French psychosociological theory (Lapassade, 1967; see also Mehan, 1978)

current level of development of our data analysis does not allow us to exclude a set of alternative hypotheses according to which our results are the expression of other factors, related to some idiosyncratic characteristics of the case analysed (i.e. as an expression of just that dyad, or of just that kind of psychotherapy) and/or to some systematic motive, different from the supposed one (i.e. as an effect of the syntactic-semantic structure of the Italian language, or of the psychotherapeutic dialog, or of the transcription format; as well as even the procedures of analysis).

Future steps of our analysis will deal with these alternative hypotheses. Meanwhile, we can focus on further issues found in the findings presented, that we consider able to open other paths worth reflection.

1.

The results concerning the number of significant correlations among factorial dimensions converge with the other findings to give substance to our hypothesis about the way the emergence process of the frame of sense happens. As matter of fact, such results depict how the frame of sense arises as a consequence of the weakening/disappearing of connections among the micro-components of meanings, as the synergetic theory describes. That leads us to our definition of frame of sense as the bounded domain of sign combination. A definition that in its turn refers to the general idea that discourse generates sense by taking off, in the style of sculpture, rather than putting on, in the mode of painting.

2.

In the case of the psychotherapy text, we have already highlighted the progressive concentration of explained inertia on the first factorial dimensions throughout the temporal ranked blocks (see in particular fig. 2). And we have interpreted such finding as an indicator of the process of hypersemia reduction. We can now observe that this process follows a temporal trend, though not perfectly linear. The trend keeps a linear course on the temporal dimension for 3 out of 4 blocks, from the first to the third, whereas the last block works in the opposite direction, showing an increase in hypersemia, thus coming back to a condition similar to block 2, the state of the discourse just after the frame of sense emergence.

In our opinion this countertendency does not go against the assumed idea of a temporal trend in the discourse dynamic of hypersemia reduction. As matter of fact, we think that one has to extend to the block 4 psychotherapy session the same observation made on the last psychotherapy session, left out of the analysis (cfr. note 29): block 4 is made up of sessions that, while not being the last ones, do belong to the conclusive phase of the relationship between therapist and patient, when both the actors know that they are going toward an imminent separation. Therefore, it is at least plausible that the effect of disorganization, and of increasing of hypersemia was active in those session too.

In the light of this consideration, the findings depict a dynamic that can be interpreted as follows. In the initial stage of the relation between therapist and patient a frame of sense emerges; the further cooperative unfolding of the clinical exchange brings with it a cumulative, but slight reinforcement of such a frame³⁸; in the conclusive stage of the clinical relationship, the separation perspective introduces/catalyses new references (i.e. the issues related to the life after and beyond the psychotherapy) and in so doing activates relevant elements of meaning in therapist-patient dialogue.

³⁸. That is in accordance with the specificity of psychotherapeutic dialogical exchange. Generally speaking, the aims of the psychotherapy (in particular, the model of psychotherapy involved in our analysis) is to enable a process of re-elaboration of the meanings (beliefs, mental schemata, interpersonal attitudes...) that organize the patient's inner and intersubjective world. To do that, psychotherapy exchange has to work as a solid and resistant interpersonal context (so to create the safety conditions that permit the patient to accept the risk of revising his deep-rooted convictions and beliefs, cfr. Weiss, Sampson *et al.*, 1986), but at the same time as a never fixed or closed semiotic space (to permit the production of new and divergent meanings; Gill, 1984; Salvatore, Grasso & Tancredi, 2005). Hence, we can expect that the psychotherapy relation is different from other kind of human dialogues, because the frame of sense that it produces tends to be (should be), metaphorically speaking, lighter, never reified in taken-for-grant beliefs/assumptions, but always open to further developments.

This implies a pressure on the discourse, in the direction of a weakening of its order; an event that our data depicts in terms of the reduction of concentration of explained inertia, that is as a countertendency of the hypersemia to increase. However, this increase in hypersemia is not catastrophic; the discourse comes back just to the post-initial level: the lack of organization concerns only the progressive reinforcement taking place after the emergence of the frame of sense at the instituting stage, but does not touch the frame of sense, as if this structure was by now an unquestionable fact.

3.

In the previous discussion about the reduction of hypersemia (in the case of psychotherapy) we referred to the concentration of explained inertia on the first ranked factorial dimensions. Actually, to be more precise, the factorial dimensions involved in the concentration are not the very first ones (the ones that explain the biggest single quote of inertia), but the ones immediately subsequent. With some approximation, one can identify these dimensional factors in the range between the 10th and the 80th. This finding is in part depicted by figure 3, which shows how the differences among the blocks (in particular between block 1 and the others) does not concern the first 10 factorial dimensions but the later one. Besides, we have already underlined that the differences of explained inertia among the blocks increase till about the 80th factorial dimension.

It is plausible to consider the first dimensional factors as the expression of a central meaning sub-component. In other words, those sub-components coming from the therapist and patient belonging to a common cultural framework³⁹; for this reason they are the first to become active in the discourse and the ones that hold the largest unitary degree of the shared communication sense⁴⁰. From a different but complementary perspective, we can interpret this first central sub-component, as the expression of the stereotypical element present in the semiotic field of the daily social thought.

Insofar as one accept this general interpretation of the ranking of the factorial dimensions, one can conclude that the emerging of sense happens as a result of the synergetic dynamic of peripheral (but not extremely marginal) sub-components of meaning, maybe the ones on which the conformist pressure of cooperative communication rules, pushing to take the culturally shared meanings for granted, is weaker⁴¹.

4.

In this work we have proposed a vision of the emergence of sense as a consequence of the selective combination of micro-components of meaning, generated by the definition of bounds to the combinatory possibility of the discourse. This vision opens an interesting possibility of linkage with the PDP model of the mind (Rumelhart & McClelland, 1986). The PDP model sees meanings as emergent patterns of connection among sub-symbolic micro components (represented in terms of network nodes). When a definition of bounds to the network connectivity is made, it carries with it the possibility of concentrating the linkages on the relatively fewer combinations satisfying the

³⁹. Just to give a hypothetical example of this kind of meaning: the value given to mental disease or to professional intervention.

⁴⁰. In other words, the first factorial dimensions correspond with the meaning components pre-existing the psychotherapy relation itself, expression of semiotic devices that patient and therapist however share even if they have never met before, just as the effect of their belonging to the same symbolic environment. In that sense, we can consider those factors as an index of the stereotypical aspect of the discursive meaning, one that is not produced from within the communication itself, but rather that is re-produced by the communication. In sum, this aspect represents the limit to the perfect 'strangeness' between therapist and patient: what in any case they share and have to take for granted in order to be able to come into contact.

⁴¹. This conclusion leads us to advance a further operative hypothesis, good for future analysis: the more similar the initial condition is to perfect 'strangeness' among actors, the more the first ranked factorial dimensions are involved in the reduction of hypersemia (as a result of the decrease in "stereotypical" factorial dimension).

bound criterion; this process generates redundancy; in other terms a pattern of learning emerges from the inside of the network.

Conclusion

This study has set itself a twofold objective. First, the presentation of a conceptual model of sense making, based on the fundamental socio-constructivist principle underlining the immanence of the meaning in the discourse dynamic (that is, the meaning does not pre-exist the discursive exchange, but it generates itself within and through the exchange itself).

Starting from these assumptions, our model proposes viewing sense making as the emergence of a frame (namely a *frame of sense*). This frame enables interpretation to be made and orients the discourse participant. More in particular, our model depicts the emergence process as a defining of limits to the virtually infinite combining capacity of signs; this boundary setting entails the strengthening of the combinations of selected signs, and therefore the development of specific discursive paths.

In the first part of this work we have highlighted some theoretical consequences of our model that we believe make it worthy of consideration. In particular, we have underlined that depicting sense making as an emergence dynamic resulting from a restricting process allows a logical paradox to be avoided, that is to hypostatize the meaning, treating it as something that pre-exists the discourse.

However, we believe that the most significant merit of our model is its capacity to establish a method of empirical analysis of the discursive dynamic. As matter of fact, the empirical representation of sense making is a very controversial issue. As we have discussed, the principal solutions of this theoretical and methodological problem are not satisfactory, because in one way or another they entail the reference at an external observer with a normative model (i.e. the list of significances used in the content analysis). For this reason, this solution clashes with the principle of the indexicality of meaning (that is, meaning is always local, depending on the discursive context).

To avoid this conceptual problem we have proposed depicting meaning in terms of lexical variability. In other words, in terms of how words combine amongst themselves so as to carry out specific distributions of combinations recurring throughout the discourse. This way of representing the discursive dynamic of meaning offers theoretical and methodological advantages over other methods.

From the theoretical standpoint, our method does not use external normative models, but it represents meaning from the inside, in the terms of one of its immanent properties (lexical distribution).

From the methodological standpoint, our method allows for an operative description of the meaning dynamic while at the same time avoiding the observer's inferential intervention. As matter of fact, lexical variability can be described by means of specific multidimensional statistical techniques. We have dedicated a specific section of this paper to presenting the technique we have used (*Factorial Analysis of Lexical Correspondences*). This technique breaks down lexical variability (in technical terminology: *inertia*) into micro-dimensions (*factors*), each of which corresponds to a quota of variability/inertia expression of a specific combination of co-occurrences. One can interpret these factors as the *operative representation of the semantic micro-components of meaning*. On the grounds of these technical assumptions, we have been able to represent the discursive dynamic in terms of the temporal evolution of the semantic micro-components of meaning (and of their combinations).

Our empirical method enabled us to test our model of the sense-making process. To this end, we have used two parameters of lexical variability:

- a) the distribution of inertia among the factors (consider that the number of factors and the amount of inertia associated with each factor changes from one analysis to another);
- b) the relation - measured by means of the correlation coefficient - among the factors.

The most relevant findings of these two paths of analysis are the following.

1. Passing from the initial phase of the discursive process to the subsequent ones (that is from block 1 to block 2,3,4), the lexical variability (inertia) tends to be reduced and concentrated on only some of the factors.
2. Again between the first and the subsequent phases of the discursive dynamic, the number of significant correlations among the factors decreases.
3. These two process are not active throughout the whole time of the discourse. Both of them only occur at the starting up phase; after this initial phase both parameters settle down to the levels reached.
4. The findings presented here are not universal proprieties of any text; in fact, we have found them in the verbatim transcription of a psychotherapy session (which we have considered an exemple of dialogical exchange) , but not in the text of a novel.

We think that these general findings show the principal issues that our theoretical model underlines on the conceptual level.

- A) Inertia reduction between block 1 and blocks 2-4 (p. 1) shows how after a starting up phase discourse restricts the possibilities for the signs to combine with each other; in other words, an asymmetry arises among probable, possible and non-allowed sign combinations. The reduction of the number of significant correlations (p. 2) shows the same process of sign specialization from a complementary point of view. One has to take into account that a significant correlation between two factors means that the two factors (thus, the two patterns of sign combination) behave in a partially linked way (i.e. one is present when the other is too; or one is present when the other is not). Thus, a smaller number of significant correlations means that signs bind themselves to a selected repertoire of signs, weakening the linkages with the other signs. We have interpreted these two findings as the empirical depiction of a process of *discursive developing of a frame of sense*. As matter of fact, our model conceptualizes the frame of sense as the binding of the sign's combination capability. That binding reduces the hypersemia of the signs, giving order to the discourse.
- B) The fact that this process of developing shows itself in a single, discrete moment (p. 3) is consistent with the assumption in our model underlining that *the frame of sense is an emergent property* of the discourse dynamic. In other words, the frame of sense is the outcome of a transitional phase: the passage from one equilibrium state to another (recall that after block 1 the parameters remain stable). The possibility of representing the developing frame of sense as an emergence leads to viewing discourse as a dynamic system, which is therefore analyzable by the conceptual and formal devices of the mathematical theory of dynamic systems
- C) Finally, we have shown that the dynamic patterns now discussed are specific to discursive exchange, rather than being universal proprieties of any text (p. 4).

This paper is an initial study, focusing on a single case analysis, that we have developed on the base of the theoretical model of discursive dynamics introduced in the first part of the article. Therefore it is useless to emphasize the preliminary and temporary character of our observations and conclusions. Other studies (in particular with other types of texts) and modality of analysis (in particular, the analysis of temporal series) are necessary to be able to ground our concepts on more solid bases. In any case, the results presented above seem encouraging to us. Regardless of their specific merit, on which, as we already said, caution is strictly required, they give us positive feedback of the heuristic validity of our theoretical model, that is of its ability to generate operative procedures of empirical analysis.

As regards the merit of the results discussed above, generally speaking we feel ourselves in a condition to affirm that the findings discussed above fit into the vision of discourse as a self-

regulating dynamic system unfolding alongside the temporal dimension. The data is quite consistent with the model proposed in the first part of this work, which sees sensemaking as an emergent process, produced from the inside of the system in terms of an enslaving dynamic whose outcome is a reduction of the sign hypersemia (in other words: a definition of bounds to the virtually infinite possibilities of sign combination). In a complementary way, the empirical textual analysis performed is a first test of the validity of our operative model, based on the idea of representing the discourse dynamic in a geometrical-formal way, in terms of a hyperspace of description, generated by the factorial dimensions depicting the lexical variability of the text. From this point of view, the findings show how the emergence of what we have called “frame of sense” can be represented in terms of a reduction of the dimensionality of the hyperspace. This result is relevant not only because it supports our model. As matter of fact, the reduction of dimensionality that we have been able to point out represents a conceptual bridge both towards the theory of dynamic systems and towards the contemporary psychodynamic theory of the mind, in particular its area interested in modelling the unconscious dimension of thought and intersubjectivity.

Furthermore, our model has implications both of a theoretical and methodological order.

From the theoretical point of view it is a peculiar formulation of a more general socio-constructivist model of the relation between social context and thought that underlines how meaning is a social construction that is accomplished *within* and *by* the intersubjective practice, as a function of how the semiotic devices are used in it. In sum, such a model moves the mind from the inside of the individuals’ heads to social and situated transactions. We have seen how this model leads to thinking of communication as a self-regulating system with the capacity not only to exchange sense but also to generate it from within, insofar as communication, in a recursive way, shapes the symbolic devices that at the same time carry it.

The possibility that our findings give to model sensemaking as a dynamic system characterized by an emergent process entails a relevant conceptual issue. As matter of fact, this possibility means that the discourse dynamic can be formally represented by means of the mathematical theory of dynamic systems. A first step in that direction is represented by the adoption of the concept of *description hyperspace*, that we have used to depict the reduction of hypersemia in terms of reduction of dimensionality. Further analyses will serve to deepen this perspective. In particular, the point is to test whether discourse works as that specific type of dynamic system defined by chaos theory. In fact, we have some qualitative and general analogies leading in such direction. First, the unstable and continuously variable character of the equilibrium constituted by the frame of sense; in other words, the fact that the shared sense is not a static structure, but it is continuously subjected to redefinition. Therefore, from this point of view, discourse is an irreversible construction unfolding through time; besides, a construction that moves within a consolidated frame of sense, but that never recovers a state identical to the one it had at a previous moment. Now, this is a typical property of a chaotic system: a system characterized by its leaning towards complex and counterintuitive conditions of equilibrium (strange attractors), that one can define as regions (instead of points) of the description space (thus a subset of points at the same time bound and infinite) that holds all the possible point-states that the evolutionary line of the system can accomplish, with the impossibility for such line to pass more than once through the same point, however long the time range is.

A last theoretical consideration regards the linkage among some of the statements made above and a theory of the mind that implies the rule of the unconscious. In particular, the model of sensemaking in terms of reduction of dimensionality has quite intriguing analogies with Matte Blanco’s psychoanalytic theory of mind, which models the unconscious as the dimension of thought working by generalization and homogenisation of signs, standing in opposition to the operative and reality-anchored thought that works to progressively reduce unconscious generalizations and, in so doing, to extract/define relations among signs. Now, Matte Blanco himself speaks of the possibility of representing this unconscious process of generalization and homogenisation in geometrical terms, as a hyperspace of infinite dimensionality (Matte Blanco, 1975). For instance, the fact that from the

perspective of unconscious thought a significant can stand for an infinite number of significances (e.g. a lover, carried away by his/her feelings - that is the most dense of unconscious kind of thought – can interpret the loved one's slap as a sign of love), is not contradictory if one admits that semantic space has infinite dimensionality. If so, the same significant can stand for different (also apposite) kinds of significance, which are far from each other on one plane, but near on one or more of the other infinite planes of semantic space.

From a methodological point of view, we consider our study as an example of how the rationale of an analysis based on a single case but able to produce transferable findings is practicable and useful. However, using the single case methodology is a logical necessity that derives directly from the acknowledgement of the self-regulating property of the discourse dynamic. This acknowledgement makes it indefensible to adopt the approach of description from outside the system, based on normative models introduced by the observer (i.e. average population behaviour; the assumption of normality in last analysis rooted in the analyser's values)⁴². In opposition to this external and hetero-normative modality, the acknowledgement of the self-regulating property allows us to assume the way of working of the observed system itself as the frame (thus the hermeneutic criterion) for the analysis of the local performances of the system (or of its subsystems). From this point of view, our analysis is an example of the possibility of producing interpretative hypotheses from the inside and related to the single case (the discourse text). As a matter of fact, our method implies a description of speech on the basis of its own structure: the description space defined by the ACFL⁴³.

Another methodological issue concerns more specifically the operative model we have proposed. From this point of view, the meaningfulness of our findings is a point in favour of this operative model of representing discourse, based on the use of the AFCL, in its turn based on the interpretation of the factors extracted as dimensions of the description hyperspace. The aspect that seems to us to characterize this model is its capability to operate according to standard algorithms (presented in the methodological section of this paper), applicable in an automatic way, with a relatively low employment of time and computing resources. We see numerous, interesting opportunities for applying such a model of discourse description. One of us currently is engaged in using it both for analysing the professional training process (Salvatore, 2005) and the psychotherapy process (Salvatore, Grasso & Tancredi, 2005). Yet, actually the method can be useful in all cases of patterns of activities that imply the mediation of interactive discourse processes (to give some examples: in domains such as educational practices, health care, organizations, cultural and inter-group transactions...). Moreover, this constitutes the premise for a formal analysis of discourse dynamics, an operation that we consider necessary in particular in order to further the development of our fundamental thesis on the chaotic character of speech.

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⁴². Most of the methods of speech analysis propose readings from the outside, based on interpretive schema/criteria defined by the observer beforehand. In this sense one can think of the classic analysis of the content, or of the use of the interview method followed later by the interpretation of the contents collected. In the last analysis, the fundamental limitation of this form of discourse analysis is that it leads to decoding the texts by means of codes other than those used by the speakers to encode the text; Salvatore, Pagano, 2005; see also Hong, 2004).

⁴³. It is useful to underline that all the techniques of Analysis of Correspondences have descriptive and not inferential functions. That implies that they are quite free from the analyser's previously made hypothesis.

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Appendix

**Table A1. Factorial Analysis of Lexical Correspondence.
Cumulative Explained Inertia (Psychotherapy text)**

Factorial Dimensions	Blk 1: Sess 1-3	Blk 2: Sess 13-15	Blk 3: Sess 60-62	Blk 4 Sess 110-112	Last sessions (out of analysis) Sess 122-124
1	1,4178	1,7384	1,9103	1,6969	1,3739
2	2,6873	3,2262	3,6563	3,3662	2,7225
3	3,9266	4,6957	5,3347	4,9684	4,0543
4	5,1357	6,1121	6,9505	6,5356	5,3678
5	6,3224	7,5128	8,452	8,0333	6,6083
6	7,484	8,8943	9,9175	9,4655	7,83
7	8,6126	10,2382	11,3643	10,8678	9,0175
8	9,7263	11,518	12,7994	12,2503	10,1934
9	10,8242	12,7859	14,1755	13,6046	11,356
10	11,9061	14,0337	15,5363	14,9146	12,5086
11	12,9489	15,2738	16,8888	16,192	13,6268
12	13,9807	16,4724	18,2172	17,4485	14,72
13	15,0053	17,6628	19,5018	18,6894	15,8076
14	16,0215	18,8381	20,7521	19,9242	16,8921
15	17,0264	20,0003	21,9912	21,15	17,96
16	18,0252	21,1515	23,2122	22,3446	19,0211
17	18,9977	22,2856	24,431	23,5048	20,0524
18	19,9562	23,3921	25,6278	24,6493	21,0751
19	20,9125	24,4824	26,8098	25,7622	22,0883
20	21,8477	25,5607	27,9751	26,868	23,0804
21	22,7796	26,6243	29,1202	27,9522	24,0563
22	23,7049	27,6677	30,2364	29,0273	25,0261
23	24,608	28,7044	31,3502	30,0842	25,9865
24	25,503	29,7236	32,4338	31,1239	26,9345
25	26,3883	30,7367	33,508	32,1562	27,8788
26	27,2678	31,7416	34,5715	33,1689	28,8083
27	28,1432	32,7394	35,6337	34,1684	29,7188
28	29,0095	33,7285	36,6626	35,1625	30,6249
29	29,8704	34,6925	37,6749	36,1454	31,5298
30	30,7244	35,6423	38,6871	37,1275	32,4255
31	31,5621	36,5883	39,6757	38,0863	33,3004
32	32,3953	37,5171	40,6494	39,0306	34,1695
33	33,2168	38,428	41,6129	39,9554	35,0254
34	34,0347	39,329	42,5702	40,8765	35,8776
35	34,8452	40,2234	43,5104	41,7773	36,7213
36	35,6529	41,1043	44,4319	42,6734	37,5595
37	36,4567	41,9807	45,3448	43,557	38,3894
38	37,2497	42,8533	46,2526	44,4322	39,2085
39	38,0334	43,7029	47,1566	45,2932	40,0201
40	38,802	44,5465	48,0189	46,1501	40,8218
41	39,5599	45,3865	48,8776	46,9903	41,6196
42	40,3131	46,2136	49,732	47,8276	42,4111
43	41,0653	47,0279	50,5774	48,6464	43,1919
44	41,8047	47,8392	51,405	49,4615	43,9653
45	42,5354	48,6336	52,2296	50,2616	44,7231
46	43,2594	49,4212	53,047	51,0539	45,476
47	43,9811	50,206	53,8466	51,8427	46,2176
48	44,6924	50,9823	54,634	52,6163	46,9552

49	45,4027	51,751	55,4084	53,3806	47,6888
50	46,106	52,5046	56,1785	54,1379	48,412
51	46,8032	53,2535	56,9415	54,8847	49,1299
52	47,4947	53,9943	57,7005	55,6224	49,8434
53	48,1731	54,7295	58,4393	56,3405	50,5505
54	48,8474	55,4473	59,1749	57,0565	51,2514
55	49,5184	56,1531	59,8991	57,77	51,9414
56	50,1775	56,8532	60,6146	58,4742	52,6282
57	50,8278	57,5496	61,3152	59,1688	53,3093
58	51,4773	58,2337	62,0063	59,8547	53,9842
59	52,123	58,9168	62,6944	60,535	54,651
60	52,7623	59,5887	63,3694	61,2114	55,3089
61	53,3933	60,2504	64,0327	61,8753	55,9645
62	54,0214	60,9028	64,6926	62,5321	56,6124
63	54,6429	61,5537	65,3506	63,1788	57,2494
64	55,2591	62,201	66,0044	63,8205	57,8802
65	55,8703	62,8366	66,6351	64,4513	58,5046
66	56,4728	63,466	67,2639	65,0761	59,1194
67	57,07	64,0867	67,8856	65,6948	59,7238
68	57,6609	64,6953	68,4984	66,3044	60,3244
69	58,2475	65,3014	69,107	66,9101	60,9189
70	58,8281	65,8999	69,7106	67,5098	61,5093
71	59,4067	66,4895	70,3049	68,104	62,0919
72	59,9824	67,0724	70,8793	68,6866	62,6724
73	60,5527	67,6495	71,449	69,2626	63,2468
74	61,1182	68,2197	72,0176	69,83	63,8097
75	61,6762	68,7837	72,5845	70,3882	64,37
76	62,2268	69,3369	73,148	70,9389	64,9249
77	62,7706	69,8877	73,6958	71,4837	65,4701
78	63,3127	70,4299	74,2379	72,0266	66,0074
79	63,848	70,9669	74,7744	72,5506	66,5432
80	64,3788	71,5007	75,2977	73,0702	67,0736
81	64,9011	72,0266	75,8153	73,5842	67,5999
82	65,4217	72,5486	76,3269	74,0872	68,1225
83	65,9373	73,0673	76,833	74,5852	68,6397
84	66,4494	73,5813	77,324	75,0786	69,151
85	66,956	74,0838	77,8132	75,568	69,6541
86	67,4581	74,5838	78,2906	76,049	70,1512
87	67,956	75,0733	78,7625	76,5155	70,6442
88	68,4525	75,5578	79,2273	76,9757	71,1352
89	68,9427	76,0315	79,6873	77,4339	71,6221
90	69,4249	76,5015	80,1413	77,8851	72,1046
91	69,907	76,97	80,5802	78,3299	72,5774
92	70,3806	77,4342	81,0132	78,767	73,0454
93	70,8481	77,8931	81,4437	79,1988	73,5059
94	71,3099	78,3421	81,8664	79,6217	73,9647
95	71,7683	78,7845	82,2859	80,0346	74,4185
96	72,2255	79,2238	82,6956	80,4453	74,8675
97	72,6787	79,6547	83,0978	80,853	75,3104
98	73,1286	80,0752	83,4897	81,2581	75,7481
99	73,5683	80,4939	83,8782	81,6542	76,1838
100	74,0048	80,9076	84,2641	82,0477	76,6122
101	74,4386	81,3181	84,641	82,4335	77,0356
102	74,87	81,7169	85,013	82,8138	77,4554
103	75,2954	82,1128	85,3767	83,19	77,8702
104	75,7181	82,5008	85,7256	83,5605	78,2835

105	76,1384	82,8802	86,0715	83,9215	78,692
106	76,5545	83,257	86,4117	84,2784	79,0906
107	76,9647	83,628	86,7498	84,6273	79,4855
108	77,3714	83,9896	87,0808	84,9691	79,8761
109	77,7749	84,3497	87,4059	85,3093	80,2569
110	78,1773	84,7031	87,7203	85,6453	80,6367
111	78,5738	85,0547	88,0333	85,972	81,0112
112	78,9692	85,4032	88,3393	86,2971	81,3821
113	79,3566	85,742	88,6428	86,6163	81,7482
114	79,7414	86,0763	88,9434	86,9309	82,1059
115	80,1229	86,4061	89,236	87,2405	82,4599
116	80,5014	86,7258	89,5195	87,5426	82,8125
117	80,8736	87,0421	89,8014	87,8419	83,1628
118	81,2429	87,354	90,0762	88,1383	83,5095
119	81,6073	87,6656	90,3427	88,4289	83,8517
120	81,9681	87,9714	90,6059	88,7134	84,1888
121	82,3258	88,2665	90,8633	88,9931	84,5194
122	82,6817	88,5556	91,116	89,2675	84,8472
123	83,0242	88,8442	91,3657	89,5347	85,172
124	83,3655	89,128	91,6112	89,801	85,4908
125	83,7023	89,4087	91,8541	90,0631	85,8054
126	84,0353	89,6862	92,0936	90,3205	86,1178
127	84,3643	89,9594	92,3301	90,5748	86,4283
128	84,6914	90,23	92,5637	90,8224	86,7366
129	85,0159	90,4928	92,7901	91,0667	87,0383
130	85,3388	90,7535	93,0082	91,3088	87,3382
131	85,6591	91,0103	93,2248	91,5459	87,6324
132	85,9731	91,2615	93,4382	91,7792	87,925
133	86,2828	91,5093	93,641	92,0069	88,2154
134	86,59	91,751	93,8399	92,2287	88,5007
135	86,8948	91,9874	94,0362	92,4492	88,7824
136	87,1946	92,2177	94,2284	92,6669	89,0596
137	87,4927	92,4463	94,4169	92,8808	89,3348
138	87,7881	92,673	94,6023	93,0912	89,6029
139	88,0775	92,8947	94,783	93,3001	89,8691
140	88,3669	93,1078	94,9583	93,5043	90,1295
141	88,6509	93,3207	95,1271	93,7042	90,3869
142	88,9301	93,528	95,2919	93,9018	90,6437
143	89,2071	93,7331	95,453	94,0969	90,8962
144	89,4801	93,9343	95,6125	94,2875	91,1457
145	89,7514	94,1326	95,7688	94,4707	91,3923
146	90,0194	94,3235	95,9232	94,6501	91,6361
147	90,2832	94,5137	96,0742	94,8285	91,875
148	90,5459	94,6975	96,2202	95,0031	92,1084
149	90,8046	94,8789	96,3625	95,1738	92,3378
150	91,0569	95,0551	96,5033	95,3433	92,5636
151	91,3061	95,2292	96,6393	95,5076	92,7861
152	91,5523	95,4018	96,7728	95,6695	93,0064
153	91,7962	95,5689	96,9032	95,8261	93,2254
154	92,0379	95,734	97,0322	95,9734	93,4395
155	92,2781	95,8977	97,1545	96,1202	93,6495
156	92,5153	96,0572	97,2755	96,2658	93,8558
157	92,7505	96,2095	97,3914	96,4082	94,0597
158	92,9833	96,3603	97,5021	96,5485	94,2577
159	93,2107	96,5108	97,6116	96,6833	94,4527
160	93,4349	96,6536	97,7173	96,8144	94,6437

161	93,6516	96,7887	97,8209	96,9417	94,8326
162	93,8654	96,9211	97,9234	97,0677	95,0146
163	94,0768	97,0533	98,0239	97,1923	95,1965
164	94,287	97,1804	98,1195	97,3108	95,3725
165	94,4923	97,306	98,2128	97,427	95,5449
166	94,6939	97,4281	98,3028	97,5421	95,7152
167	94,8906	97,5483	98,3898	97,6542	95,8823
168	95,0841	97,6654	98,4735	97,7655	96,0462
169	95,2744	97,7798	98,5547	97,8694	96,2049
170	95,4597	97,8919	98,6338	97,9725	96,3633
171	95,6418	97,9974	98,7091	98,0697	96,5205
172	95,8227	98,1005	98,783	98,1657	96,677
173	96,0025	98,2024	98,8546	98,2597	96,8295
174	96,1756	98,3014	98,9234	98,352	96,9771
175	96,3484	98,3967	98,99	98,4401	97,1211
176	96,5181	98,4888	99,0533	98,5263	97,2635
177	96,6841	98,5789	99,1122	98,6102	97,4046
178	96,8478	98,6659	99,1708	98,6924	97,5384
179	97,0082	98,7509	99,2288	98,7717	97,6701
180	97,1673	98,8328	99,2809	98,8469	97,8005
181	97,3206	98,9104	99,3327	98,9182	97,9271
182	97,4716	98,9846	99,382	98,9851	98,0502
183	97,6201	99,0537	99,4307	99,0502	98,1687
184	97,7667	99,1221	99,477	99,1139	98,2849
185	97,9098	99,1895	99,5203	99,1747	98,3985
186	98,0482	99,256	99,5618	99,235	98,5101
187	98,1831	99,3195	99,6027	99,294	98,6141
188	98,316	99,3798	99,6388	99,3494	98,717
189	98,4455	99,4383	99,6728	99,4046	98,8168
190	98,5738	99,494	99,706	99,4578	98,9144
191	98,6985	99,548	99,7378	99,5101	99,0071
192	98,8209	99,6001	99,7677	99,5591	99,099
193	98,9407	99,6486	99,797	99,607	99,1891
194	99,0554	99,6955	99,8233	99,6521	99,2784
195	99,1673	99,7378	99,8485	99,6939	99,365
196	99,2753	99,7786	99,8732	99,7348	99,4486
197	99,3804	99,8148	99,8957	99,774	99,529
198	99,4846	99,8488	99,9161	99,8088	99,6061
199	99,5834	99,8816	99,9359	99,8426	99,6801
200	99,6802	99,9132	99,9531	99,8746	99,7508
201	99,7741	99,9409	99,9689	99,906	99,8176
202	99,8604	99,9666	99,9828	99,9327	99,882
203	99,9419	99,9862	99,992	99,9564	99,9434
204	99,9775	100	100	99,9791	100
205	99,9999	100	100	100	100

Table A2. Factorial Analysis of Lexical Correspondence. Cumulative Explained Inertia (Novel text)

Factorial Dimensions	Blk 1 : Chapter 1-3	Blk 2 : Chapter 4-6	Blk 3 : Chapter 18-20	Blk 4 : Chapter 33-35
1	1,7478	1,6951	1,7527	1,5884
2	3,4444	3,35	3,3262	3,0577
3	5,0376	4,8518	4,8682	4,4855
4	6,4865	6,3079	6,3506	5,8814

5	7,8887	7,6953	7,8038	7,1943
6	9,274	9,0532	9,1938	8,4632
7	10,5865	10,3776	10,569	9,7231
8	11,8747	11,6904	11,9355	10,9705
9	13,1547	12,9857	13,2775	12,1841
10	14,4092	14,24	14,5986	13,3731
11	15,6256	15,4757	15,911	14,5369
12	16,8363	16,6963	17,1967	15,6952
13	18,0291	17,9014	18,4534	16,8397
14	19,1901	19,0988	19,6758	17,9693
15	20,3364	20,2601	20,8936	19,0843
16	21,4722	21,4137	22,098	20,1767
17	22,5935	22,5615	23,2629	21,263
18	23,6962	23,6883	24,4077	22,3265
19	24,7966	24,8046	25,5239	23,3848
20	25,8883	25,9168	26,6209	24,4251
21	26,9587	27,0017	27,707	25,4623
22	28,0194	28,0748	28,7876	26,4778
23	29,0547	29,1451	29,8551	27,4883
24	30,0832	30,1958	30,9139	28,4858
25	31,1065	31,2384	31,9447	29,4532
26	32,1225	32,274	32,9683	30,4184
27	33,1092	33,2942	33,9804	31,3645
28	34,0874	34,288	34,9715	32,304
29	35,048	35,2727	35,9571	33,2369
30	36,0016	36,245	36,9304	34,1579
31	36,9477	37,1941	37,8923	35,078
32	37,8755	38,1284	38,8487	35,9865
33	38,7946	39,0586	39,8025	36,8817
34	39,7001	39,9798	40,7426	37,765
35	40,5968	40,8972	41,6726	38,6393
36	41,4906	41,802	42,5964	39,5053
37	42,3777	42,6892	43,5077	40,3599
38	43,2586	43,5679	44,3985	41,2077
39	44,1285	44,4349	45,2783	42,0476
40	44,9819	45,2937	46,1464	42,8819
41	45,8261	46,1405	47,0023	43,7082
42	46,6622	46,9743	47,8515	44,5244
43	47,4897	47,7982	48,6891	45,3373
44	48,3114	48,6137	49,5115	46,1429
45	49,1198	49,4236	50,3288	46,9406
46	49,919	50,2263	51,1234	47,7144
47	50,7052	51,0193	51,9097	48,4829
48	51,4901	51,8019	52,6923	49,2478
49	52,267	52,5763	53,4646	50,005
50	53,0341	53,3478	54,2239	50,749
51	53,7918	54,1061	54,9769	51,491
52	54,542	54,8548	55,7207	52,2248
53	55,2678	55,5938	56,4587	52,9571
54	55,9883	56,3205	57,1893	53,6831
55	56,7051	57,0393	57,9032	54,3904
56	57,4111	57,7493	58,607	55,097
57	58,1018	58,458	59,3056	55,7918
58	58,7823	59,154	59,9968	56,4824
59	59,4562	59,8429	60,6813	57,1644
60	60,1267	60,5229	61,3562	57,8296

61	60,786	61,1999	62,0216	58,4945
62	61,4375	61,8682	62,6848	59,1474
63	62,081	62,5217	63,3411	59,7973
64	62,7186	63,1623	63,9866	60,441
65	63,3488	63,7942	64,6248	61,0808
66	63,9742	64,4208	65,2562	61,7102
67	64,5887	65,0439	65,882	62,3296
68	65,1943	65,6588	66,4954	62,9427
69	65,7935	66,2651	67,1074	63,5536
70	66,388	66,87	67,7065	64,1556
71	66,9734	67,4715	68,3038	64,7493
72	67,5543	68,0608	68,8905	65,3365
73	68,1297	68,6337	69,4608	65,9172
74	68,6957	69,1997	70,0229	66,4926
75	69,2528	69,7624	70,5792	67,0649
76	69,8021	70,3136	71,1313	67,6335
77	70,3471	70,8604	71,6804	68,1948
78	70,8887	71,4002	72,2224	68,7533
79	71,4226	71,9348	72,7587	69,3043
80	71,9501	72,4629	73,2865	69,8543
81	72,4709	72,9825	73,801	70,3874
82	72,9859	73,5013	74,3074	70,9144
83	73,4919	74,0104	74,8125	71,4325
84	73,993	74,5119	75,311	71,9465
85	74,4912	75,0005	75,8005	72,4541
86	74,9794	75,4852	76,2801	72,9573
87	75,4635	75,9667	76,7481	73,4578
88	75,9432	76,445	77,2122	73,949
89	76,4192	76,9149	77,6746	74,4362
90	76,8907	77,3812	78,1309	74,9146
91	77,3585	77,8371	78,5787	75,3867
92	77,8154	78,2901	79,018	75,852
93	78,2677	78,734	79,4551	76,3102
94	78,7142	79,1741	79,8848	76,7606
95	79,1522	79,6075	80,3126	77,2091
96	79,5844	80,0338	80,7377	77,6561
97	80,008	80,456	81,1504	78,0998
98	80,427	80,8739	81,5539	78,5294
99	80,8346	81,2877	81,9528	78,954
100	81,2407	81,6954	82,3497	79,3772
101	81,6411	82,1006	82,7398	79,7995
102	82,0282	82,496	83,1231	80,2105
103	82,4124	82,8835	83,5032	80,6172
104	82,7929	83,2692	83,8799	81,0211
105	83,1727	83,6478	84,2501	81,4152
106	83,5477	84,0245	84,614	81,7996
107	83,917	84,395	84,97	82,1805
108	84,2794	84,7579	85,3197	82,5592
109	84,6362	85,1164	85,6664	82,9336
110	84,9904	85,4709	86,008	83,2995
111	85,3353	85,8213	86,3445	83,6611
112	85,6768	86,1693	86,6758	84,021
113	86,0143	86,505	87,0034	84,3789
114	86,3481	86,839	87,3245	84,7309
115	86,6741	87,1674	87,6375	85,0745
116	86,9979	87,4898	87,9487	85,4147

117	87,3203	87,8031	88,254	85,7526
118	87,639	88,1154	88,5554	86,0852
119	87,9484	88,4207	88,8546	86,4134
120	88,2476	88,7235	89,1464	86,7365
121	88,5428	89,0205	89,433	87,0582
122	88,8367	89,3104	89,7131	87,3707
123	89,1248	89,5944	89,9878	87,6796
124	89,4065	89,8754	90,2603	87,9825
125	89,6831	90,1521	90,5285	88,2845
126	89,9576	90,4225	90,7884	88,5799
127	90,2277	90,6856	91,0466	88,8724
128	90,4957	90,9443	91,298	89,16
129	90,7548	91,2009	91,545	89,4449
130	91,0103	91,4538	91,7872	89,7239
131	91,2645	91,704	92,0253	89,9983
132	91,5165	91,95	92,2577	90,2665
133	91,7669	92,1893	92,4886	90,5326
134	92,0121	92,4268	92,7137	90,7965
135	92,2503	92,6607	92,9377	91,0525
136	92,4825	92,8936	93,1525	91,3076
137	92,7103	93,1188	93,3645	91,5529
138	92,9368	93,3411	93,5736	91,7977
139	93,1603	93,5587	93,7738	92,041
140	93,3767	93,7723	93,9716	92,2778
141	93,5921	93,9825	94,1658	92,5102
142	93,8008	94,1878	94,358	92,7387
143	94,0026	94,3886	94,5471	92,9631
144	94,2036	94,5856	94,7315	93,1799
145	94,4036	94,7779	94,9143	93,3934
146	94,6001	94,9671	95,0934	93,6044
147	94,7942	95,1539	95,2701	93,8132
148	94,9838	95,33	95,4422	94,0183
149	95,1706	95,504	95,6097	94,2186
150	95,3554	95,6748	95,7729	94,4183
151	95,5335	95,8421	95,9341	94,6133
152	95,7045	96,0055	96,0891	94,8049
153	95,8722	96,167	96,2424	94,9955
154	96,0365	96,3268	96,3933	95,1793
155	96,1978	96,4796	96,5414	95,3616
156	96,3527	96,6321	96,6848	95,5422
157	96,5073	96,7796	96,8245	95,7141
158	96,6535	96,9222	96,9622	95,8799
159	96,7989	97,0604	97,0972	96,0453
160	96,9418	97,194	97,2291	96,2069
161	97,0814	97,3249	97,3579	96,3642
162	97,2197	97,4506	97,4846	96,5191
163	97,3528	97,5738	97,6086	96,6718
164	97,4824	97,6946	97,7298	96,8205
165	97,6078	97,8129	97,8434	96,9666
166	97,7322	97,9264	97,9542	97,111
167	97,8513	98,0387	98,0629	97,2504
168	97,9692	98,1467	98,1658	97,3884
169	98,084	98,2514	98,2672	97,5203
170	98,1944	98,3533	98,3663	97,6501
171	98,3023	98,4493	98,4619	97,777
172	98,4077	98,5437	98,5551	97,8984

173	98,5118	98,6363	98,6463	98,0197
174	98,6118	98,7254	98,7352	98,1368
175	98,7082	98,8117	98,8199	98,2525
176	98,8043	98,8968	98,902	98,362
177	98,8944	98,9792	98,9814	98,4689
178	98,9786	99,0579	99,0589	98,575
179	99,0594	99,1332	99,1342	98,6785
180	99,1369	99,2034	99,2057	98,7778
181	99,2119	99,2726	99,2733	98,8751
182	99,2828	99,3389	99,3388	98,9683
183	99,3523	99,403	99,4019	99,0583
184	99,421	99,4644	99,4633	99,1464
185	99,4832	99,5226	99,5216	99,2307
186	99,5443	99,5759	99,5746	99,3136
187	99,6017	99,6287	99,6256	99,3932
188	99,6584	99,6793	99,6738	99,4714
189	99,7128	99,7286	99,7191	99,5444
190	99,7638	99,7741	99,7613	99,6141
191	99,8139	99,8171	99,8017	99,6805
192	99,861	99,8587	99,8391	99,7463
193	99,9037	99,8947	99,8755	99,8055
194	99,9439	99,9297	99,9108	99,8615
195	99,9817	99,9629	99,9434	99,9111
196	99,9941	99,9943	99,9734	99,9576
197	100	100	100	100