

ALBERTO GRECO

University of Genova (Italy)

THE HYPOTHESIS OF "DIFFERENTIATION"  
IN THE PROCESS OF UNDERSTANDING  
AND IN INTERPERSONAL RELATIONSHIPS\*

1. *The concept of "differentiation"*

The problem discussed in this paper arises from the observation that in the course of inter-subjective communication "understanding" seems to be entrusted to the implementation of a real process, not only affective but also cognitive, of processing information contained in the perceived behavior. In a previous study (Greco, 1979) we proposed to consider this process of "reconstruction" of meaning as analogous to the process of "construction" used for oneself. Here we will deal with this process of construction or awareness using theoretical models offered by experimental research.

The emphasis will be placed essentially on the cognitive mode through which we come to consider an *input* (produced externally or even inside the organism) as having a precise and particular meaning. Subsequently, we will examine some problems that may be generated by the extension of this model of cognitive activity to interpersonal understanding and the role that interpersonal relationships play in the process itself.

Let us start, as we said, from the hypothesis that comprehension, at least the comprehension of behavior (in which language is included)<sup>1</sup>, is a process, i.e., a phenomenon that does not occur in a single moment, but whose course can be identified, in which phases can be isolated (not necessarily distinct in time, but distinct in function). One of the main arguments that support this statement is provided when we ask ourselves the question whether we "know" what we are going to say (or to do) before we say it (or do it). It is evident that it is impossible not to give a positive answer to this question, that is, it is impossible not to admit that "in some way" we must "know" what we are going to express before we do it.<sup>2</sup> We must however specify what "in some way" means, because our experience almost always presents us with evidence of what we express as an immediate creation and not as a "process". This can only be explained by hypothesizing that the degree and quality of our awareness of meaning are different at different times in the process of its construction and expression. It is not just a question of whether or not we are ready for consciousness, but it is something that concerns the quality, the type of structure that meaning has.

Now, if we accept that from the same primitive state more complex and structured awareness follow, we can define the structuring process and our understanding-construction as a *differentiation*.

In the study of thought and language, the term was first used by Kurt Lewin (1935); for Lewin, "differentiation" was an increase in the number of "regions" that occurs in a person when spaces in a region become independent of each other and thus the region is divided into several parts. This conception is close to other subsequent ones, which indeed have taken their cue from it, because it is implicitly perceived that the partition takes place by specialization of functions.

This aspect was better highlighted by Werner (1948;1957, p.126), who compared it with a similar concept used in embryology, where it has the sense of development implying not only an increase in quantity but also in structural complexity and in variety of functions. From a single egg-cell, for example, several types of cells develop with specialized functions that have a complex structuring and articulation in a hierarchical sense of the reciprocal relationships.<sup>3</sup>

An interesting application of the concept of differentiation to the study of the *development of the thinking*

---

\* English translation of the original Greco (1979) L'ipotesi della differenziazione nel processo di comprensione e nelle relazioni interpersonali. In: AA.VV., *Studi di Psicologia*, Vita e Pensiero, Milano, vol.II, pp.113-139.

<sup>1</sup> This applies, in fact, also to the perception of any stimulus: as Gestalt theorists have pointed out, perception is automatically structuration, attribution of meaning.

<sup>2</sup> This problem, of the way we know what we are going to express, is recognized by Boyle (1971) as one of the most important in the relations between thought and language: «A sentence proceeds from left to right, but the first parts of the sentence have a sense which is determined by the last parts. Thus in the sentence "I am going to eat lunch" the idea of lunch must precede the idea of eating, and both must precede the notion that I am going to do something. If this were not so, we would be forced to accept the somewhat absurd assumption that, like Alice, I may have no idea what I am going to say until I have said it. There is a further problem: let's say that I have said something, how do I know that it was exactly what I meant to say? We have all had the experience of saying something we didn't mean. Freud made use of this observation in his theory of unconscious forces... It is reasonable to suppose that, having said something, we can recognize it as what we had in mind to say; which leaves us with the problem of understanding what we meant by 'having in mind something to say'» (Boyle, 1971, p.204).

<sup>3</sup> One definition given by a biologist is as follows: «Differentiation is a transformation from a more general and homogeneous condition to a more particular and heterogeneous condition» (Cowdry, 1955).

*process* is due to Werner. In particular, this author argued that mental functions progress and distinguish themselves from each other starting from a "syncretic" state in which perceptions (synesthetic), motivations, concepts, language (holophrastic), etc. are still united (Werner, 1948). To indicate this process, Werner used the term "microgenesis".

Other authors who subsequently resumed this concept (Witkin et al., 1962), used it mostly with reference to ontogenetic diversification of psychological capacities and processes, although the definition they gave does not exclude its use in other contexts: in fact, this definition explicitly confronts systems theory, and differentiation becomes, in general terms, the increase in the "complexity of the structure of a system," whether psychological or biological or social, and implies above all a specialization of the functions of subsystems (Witkin et al., 1962, p. 9; Bertalanffy, 1968, p. 321).

In our context, the differentiation hypothesis implies that from an idea (or pre-idea) that contains within itself a range of possible outcomes, other ideas develop with a more precise functional role and that leave open a smaller range of alternatives.

Werner himself attempted an experimental demonstration of the assumption of "microgenesis" with the presentation of stimuli to the tachistoscope. These stimuli in some experiments consisted of verbal material and in others consisted of tables of the Rorschach test. These experiments would show that the brevity of the presentation does not allow the full articulation of the perception of verbal meaning and, in the Rorschach, that perceptions tend to be global and undifferentiated in structure (Werner, 1957).

Other more recent research (Fraisse, 1969) shows that the latency time is significantly higher for the recognition of complex images, compared to the time required for the recognition of simpler images. This is further support for the hypothesis of a process of differentiation, that is - as we shall see - a complex selection that can occur even in a few microseconds.

## 2. Indifferentiation

The hypothesis of differentiation implies, therefore, that in the course of expressing one's own behaviors, as well as in the course of reconstructing those of others, one moves from a phase of undifferentiation to a phase of progressive differentiation. This process of differentiation concerns the structure of the definition that is given at a cognitive level of the behavior (which, as pointed out in our already mentioned previous work, cannot make sense independently from a cognitive act that defines its contours). Moreover, differentiation may concern the structure that can be seen in the behavior when it is studied scientifically. In this context, an expression is *differentiated* when it is articulated in a complex structure, follows codified rules and norms (such as syntax in the case of verbal language) or, in any case, uses a logic suitable for distinction, similar to that defined as "symmetrical" by Matte Blanco (1975), and contains very specialized functors for particular purposes (e.g. adverbs, particles, etc. in verbal language) which, in themselves, would not be essential to the central meaning but are almost a complement, a specification, an enrichment.

If it is quite easy to outline operationally what is to be considered a "differentiated expression", what is more difficult is to talk about the *undifferentiated* phase. The reason for this is obvious, since what is undifferentiated is by its nature less accessible to direct introspection, or rather it is - as we shall see - only accessible through differentiation. This does not mean, therefore, that the undifferentiated is ineffable. Even undifferentiated knowledge, that "for oneself", is an activity that implies the arrival of something "new" to consciousness, and as such "informative", cognitive. It is, however, a global input, the details of which cannot be discerned, and which, with a more accurate focus, may lead to different specifications (with some essential common denominator).

What is undifferentiated is not unconscious. It is not a matter of ideas that, although not conscious, influence the development of other ideas. The factors in consciousness are one of the factors that determine the orientation of the development of differentiation in one direction rather than another, but they are not the initial moment of the development itself. Here we are dealing, instead, precisely with the ideas that constitute the "course" of consciousness, that is, the continuous and uninterrupted sequence of thoughts (and the same is true, as we shall see, for behaviors) as they develop and become more precise.<sup>4</sup>

Above, we pointed out that before we express something, we must somehow "know" it already. Therefore, if at the level where meanings are not differentiated, we do not yet have available the precise words (or behavioral sequences) available, it is evident that we are dealing with a pre-verbal or pre-behavioral level.

The "pre-verbal" level can be described as something that operates with a kind of linguistic coding that is less

---

<sup>4</sup> One might ask where these undifferentiated ideas come from, and how they arise as well. Certainly thought is not created out of nothing. Goals, needs, values, all "contextual" factors are basically ideas that influence the development of other ideas. However, it does not seem reasonable to push the search for the original ideas that are the "foundation" of other ideas beyond a certain limit, because it would be inevitable a regress to infinity. In our opinion this is a problem that for the moment cannot be solved by psychology, just as this science cannot answer the implicit question: why does man think? What interests us in our context, however, is not this, but why man thinks just certain things and is able to make them understood by others.

structured than language itself. The hypothesis that comes closest to this description is that of inner language, the importance of which we have already emphasized (Greco, 1979) with regard to the continuum between consciousness and behavior.

But this way of conceiving the level of undifferentiation is not the only possible one. It is not necessary to assume in any case a linguistic or verbal structure: among other things, this would imply the acceptance of the assumption that thought works essentially through language, which is only partially true, according to what is now commonly accepted. A similar structuring can be hypothesized for "pre-behavior", which would consist in the use of particular precursory models of action (or *schemas*). In the previous work to which we have referred above, we proposed the concept of "pre-behavior" as an extension of the concept of "inner language", in the sense that it would be understood as a broader phenomenon of which the inner language, the schemas, and other activities of which we will speak shortly as the "mental images", are aspects.

The hypothesis of the implementation of a pre-behavioral coding is suggested by the new tendency not to separate and privilege verbal expression from the expression of the whole behavior. Just as verbal expression is supposed to have a repertoire of "models" of construction<sup>5</sup> stored in memory, it is also plausible (and this is proven, for example, by research on the "body schema": Schilder, 1950) that before any expression there is a less articulated and more condensed structuring of the behavioral model that will be used for communication. In other words, a precursor of action, which, starting from the same model, can develop or build in different behaviors.

As anticipated, the concept of "antecedent behavioral model" is similar to what has been intended by some authors under the term "schema" (Bartlett, 1932; Piaget, 1937; Bruner, 1956). In these cases, however, the relationship between the coordination of complex actions, as something that requires hierarchical integration, and the coordination of cognitive activity in general. Instead, it remains in the shadows the intrinsic value of schemas as antecedents of expressive activity.

Another concept that can be used to describe the level of indifferentiation is, as mentioned, that of "image"<sup>6</sup>. Head, who in 1920 in his *Studies in Neurology* was the first to propose the concept of "schema", had already observed that models of body postures can come to consciousness as images or, more often, remain outside of it, forming those organic patterns of knowledge of the body postures that he called precisely "patterns" (Schilder, 1950, p. 36).

But if Head contrasted images and schemata, relying on the criterion of whether or not they were present in consciousness, there remained the problem of understanding what nature of mental activity the schemata had. Piaget avoided this problem in the connotation he gave to the concepts of "image" and "schema": in his theory, the image is a schema, being a concrete mental representation that imitates a specific action, the first step towards the construction of conceptual schemas (Piaget, 1946).

The real problem underlying these two conceptions of the role of the image in encoding at the undifferentiated level is that this role can be intended in two different senses:

- (a) image coding is hierarchically more primitive than verbal-behavioral coding;
- b) it is an alternative type of coding to the verbal-behavioral one.

The solution that Paivio (1971) proposed for this problem, following his research on the influence of the two types of encoding on memory, is well known: language and image are two processes of different nature.

The question of the nature of the encoding process which precedes expression and which, according to our proposal, should constitute the terminal point of the decoding analysis, does not seem to have a satisfactory answer in the present state of research.

However, it is important to keep in mind that the greater or lesser differentiation of expressive behavior, i.e. its being pattern or image, involves, nevertheless, consequences for intersubjective understanding. If differentiation stops at a level of insufficient structuring, cases of ambiguity and polysemy may occur, since even the differentiation of another subject will not be able to continue beyond the level of structuring reached by the first, for lack of information elements that allow to make further choices. If such choices were made, however, the understanding would be less approximate and more detailed, but it would also probably be less definable as an "understanding". In such cases, one should not be reluctant to admit the "unintelligibility" of the message, unless contextual factors (discussed below) constitute such strong parameters as to coercively impose a particular differentiation. Sometimes those who express (or transmit), purposely leave, for more or less conscious reasons, the behavior insufficiently structured or codified so that the differentiation alternatives, lacking contextual factors, can be different. Normally, however, human beings have such a "need for structure", and therefore for meaning, that, at least for themselves,

---

<sup>5</sup> After the diffusion of Chomsky's ideas, it is now commonly accepted that it is not plausible to hypothesize a memorization of all the single expressions that can be produced, but, rather, of strategies of organization of the expression.

<sup>6</sup> It should be noted, of course, that the term "image" does not have here the sense of "internal perception of visual images" (as in the famous controversy in which the Würzburg scholars were involved, concerning the necessity of such images for the functioning of thought). Here we mean, in a broader sense, any pattern of representations, not specifically related to a sensory modality (Newell, Shaw, & Simon, 1962).

they try to differentiate their states of consciousness as much as possible and to give a definite meaning to their behaviors.

### 3. Cognitive dynamics of differentiation

The problem of defining the nature of the level of undifferentiation of an expression, as we have seen, remains open. This level, which constitutes the starting point of the process of achieving meaning, can be regarded as the presence of a structure that is not fully articulated (in various gradations) in the consciousness-behavior continuum, and several concepts can be used to describe this presence. In its pre-conscious aspect it can be described as an inner language, of a "predicative" or holophrastic nature; in its pre-behavioral aspect it can be described as an inner "schema" of action; in both aspects it could take on the character of an "image".

In order to better clarify how from the initial presence of an "input" a more precise meaning can develop in a certain direction, we will now turn to the results of some experimental investigations that have recently been carried out in the cognitivist field.

The dynamics of the differentiation process includes essentially two aspects:

- (a) the selection of a particular input (at a more or less differentiated starting level);
- (b) the specification of that input through an increase in the complexity of its structure.

This section, therefore, will be divided into two parts, in the first of which we will deal with the selective aspect, culminating in a semantic decision, and in the second with the increase in complexity.

#### A. The selection of input

It has been said that the starting point for differentiation is the selection of a particular "input", i.e. the entry of something structured, at a more or less precise level, into the consciousness-behavior continuum. The term usually used in psychology to indicate the process of selection of what enters the field of consciousness is "attention" and theories of attention, in fact, can be used to explain the use of this or that information as a starting point for semantic differentiation.

One can hypothesize, for example, a mechanism that presides over this selective choice, which "filters", so to speak, among the various elements of the context what at a certain moment is *relevant* for the entrance or exit into the field of consciousness or behavior. One of the first hypotheses on the mechanism of attention, that of Broadbent (1958), was just like this: a "filter" selects the contents that will be able to pass. Later the same author (Broadbent, 1971) proposed a more complex model that we will consider below.

For the moment, however, it is not so important the model related to the functioning of selection, but rather the problem of how something in a certain moment is recognized as relevant, i.e. significant.

All recent theories of attention agree that the first choice, preceding any other, is made in order to select the input, i.e. the source of stimuli.<sup>7</sup>

In this, the properties or characteristics of the stimulus have a certain importance. Which properties of the stimulus have the effect of increasing the probability that it enters the field of consciousness has been pointed out, for example, by Berlyne (1960), who described a series of variables, defined as "collative", which influence the selection mechanism. Among these, particular importance is given to novelty and uncertainty, which, translated into the language we have adopted, mean "presence of something different" (Greco, 1978, 1979) and "undifferentiation" (uncertainty, a concept derived from information theory, also refers to the possibility of deriving different information from it).<sup>8</sup>

What seems to us to be more relevant, however, is not so much the action that the properties of the stimulus have, as much as the role that intrinsic characteristics of the way of relating to the stimulus have in selection.

The major problem that has plagued scholars of attention has been whether there is a physical selection of the stimulus prior to the recognition of its "meaning" or whether selection depends on that very recognition. The dispute between Treisman (1964) and Norman (1968) over the interpretation of the results of experiments on dichotic stimulations<sup>9</sup> is an example of the uncertainty that has dominated scholars in this field.

---

<sup>7</sup> The concept of "stimulus" would deserve to be discussed more extensively, but here we will accept its most common definition. Stimuli can therefore be considered variations of previous states of the stream of consciousness, determined by changes in the characteristics of the external physical environment or by changes in "internal states", to the nature of which (neurophysiological, electrochemical, etc.) we are not interested here.

<sup>8</sup> Berlyne interprets the action of these variables in neurophysiological terms, as an increase in the degree of activation of the cerebral cortex. This interpretation, however, is not the only possible one.

<sup>9</sup> Dichotic stimulation is defined as the simultaneous presentation of two stimuli through two distinct receptors (e.g., the two ears). A review of the most important experiments and the point on the problem can be found in Norman (1969).

From our point of view, this problem does not arise: even in dichotic stimulation, the choice of input is gestaltic, that is, it has automatically a meaningful structure at some level of differentiation. It is not possible to choose an input and then give it a meaning, but this does not mean that the choice or the exclusion of the input depends on the perception of a meaning: meanings can be grasped even at an undifferentiated level. When there is "something" in the field of consciousness, it is always something significant, regardless of how it was chosen. On this point (choice) one could proceed to further experimental investigations that take into account the differentiation hypothesis.

Broadbent (1971) hypothesized three strategies for processing information within a "limited capacity channel" (a concept that closely resembles that of "consciousness"): *categorization*, *storage*, and *filtering*. The choice of the starting point of the process is *categorization*, which - of great interest - Broadbent considers as both input and output selection.

If "archiving" is of no interest for our purposes<sup>10</sup>, it is significant instead to note how *filtering*, in Broadbent's second version, has become a hierarchical process: only if some key-features are present is it possible for other features to enter the field. This is in agreement with our hypothesis, if we consider these key-features as those possessing the essential traits - present even at the level of undifferentiation - for the identification of meaning. The other features, hierarchically subordinate to the first ones, constitute the possibilities of specification in the course of differentiation.<sup>11</sup>

We said that the first moment of the process is the choice of the starting point. It is not necessary to assume that this starting point is always to be placed at the level of undifferentiation: it is possible that sometimes we start immediately from something already differentiated and stored as such in memory.<sup>12</sup> This is likely to relate to the short-term memory system. In fact, the "rehearsal" hypothesis (Sperling, 1967) implies that one remembers better in the short term what has been verbally differentiated and articulated (just as one is more likely to remember a behavioral sequence that has already been performed than one that has been purely imagined: this point deserves further investigation by means of an experimental study).

Whith long-term memory, however, it seems that a preservation of information at an undifferentiated level is preferred: a single keyword can refer to a series of connected ideas and every time we go down the same path. This phenomenon is well known by those who, like the lecturer, having to give a long speech, do not need more than a few brief points on which then "develop" a much more articulate speech.

The model of the selection of initial choice possibilities can also be extended to the selection of subsequent states in the course of differentiation. One of the simplest and most immediate hypotheses, compatible with the theories of attention, describes selection as a process of "scanning". This term, taken from electronics, refers to a mechanism that explores, one by one, all the possibilities of differentiation, discarding or excluding some of them until it finds the one to be inserted. This model, for some aspects, can be objected to, but if we take into account some factors that we will now consider, it can be, in the final analysis, accepted.

The main difficulty would reside in the fact that such a scanning process should imply a very long, if not infinite, time before any semantic decision. This contrasts, however, with the most common and evident experience. This difficulty is surmountable if one keeps in mind that:

- (a) the possible states or sequences of states to be selected are organized hierarchically;
- (b) the processing time of a sentence increases with super-ordinate categories.

The hierarchical organization of the consciousness or behavioral states that will be selected implies that each state is not isolated, but connected to the others in such a way as to constitute a logical structure, a well-defined pattern. This structure has a hierarchical organization, i.e., it is made up, among other things, of inclusion relations, so that a single finding element can comprise an entire program and can in turn constitute a sub-routine of a more general program. In addition, some elements may be logically incompatible (e.g., mutually exclusive or contradictory) with others and thus with entire sets of programs. In this way the process of selection is enormously more economical, because it is enough to exclude a single element to exclude entire categories of alternatives.

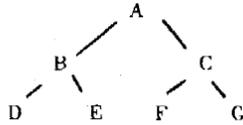
The hierarchical organization can be depicted in a simple diagram as a tree graph, analogous to those used by Chomsky in the structural description of verbal expressions:

---

<sup>10</sup> "Archiving" is about arranging information into categories, it is not selective in nature, and as far as output is concerned, it increases the likelihood that one will emerge rather than another.

<sup>11</sup> Broadbent's model, linked even more to behavioristic schemes than cognitive ones, despite these interesting ideas remains, in our opinion, too mechanical, as it does not refer to the significance but to the probability of the stimuli, to the state of activation of the subject and to something similar to habit.

<sup>12</sup> In particular cases, an inverse process of de-differentiation can be hypothesized. It is possible, starting from very linguistically structured material, that one arrives at a psychologically undifferentiated state. This is typical of the phenomenon of "falling" of meaning or "semantic saturation" (Lambert & Jakobovits, 1960) and also of certain states of induction of hypnosis, or hypnagogic, etc. This process, however, is not used in comprehension.



According to the scheme, it suffices to discard A to exclude all other possibilities. Chomsky himself extended the structural analysis of language to the structure of "complicated behavior" (Chomsky & Miller, 1963). This structure could be, according to this hypothesis, a hierarchical system of TOTE units (Miller, Galanter, & Pribram, 1960).

The element that subsumes the following ones can therefore be a prototype, more or less differentiated, of a specific category of alternatives. This hypothesis agrees with the results of recent research on semantic categorization, which has addressed the problem of the encoding of categories and concepts in memory and their use in information processes. For example, Rosch (1973, 1975) concluded that, contrary to what so many traditional philosophical, psychological, and linguistic conceptions have asserted, "not all categories are necessarily bounded logical entities whose membership is defined by possessing an item of a simple set of criterial features, in which all examples possessing the criterial attribute have a full and equal degree of membership" (1975). Rather, many natural categories have an internal structure that points to a prototype, consisting of the clearest cases or best examples. This hypothesis of the internal structure of categories, as it applies to their mental representation, seems supported by studies of the development of color categories (Rosch, 1973, 1975; Mervis et al., 1975).<sup>13</sup>

As we have already mentioned, the second factor that would suggest a complex processing of the stimulus in relation to its categorical value is the fact that the time of comprehension of meaning is longer when the category is more superordinate or defining.

This is the result of the well-known research of Collins & Quillian (1969), which can be interpreted in the sense that if in the choice one has to decide between many possibilities of differentiation, the process will be longer.

## B. The increase in complexity

The process we have described so far accords with cognitive research on selective input mechanisms (attention and categorization); we have designed a model that sees a series of meanings hierarchically arranged in categories and mechanisms for exploring the possibilities of choice. But, as we have observed above, in differentiation there is not only an aspect of selection but also an aspect of "complexification".

Differentiation, in other words, has an aspect of "creativity" that is not explicable by talking only about the properties of the stimulus or its selection, that is, if we do not bring into play also particular ways of approaching the stimulus.

It seems necessary, then, to consider how creativity in selection accords with understanding. If all possibilities of differentiation were followed, it would be difficult to meet and understand each other. In order to explain how the narrowness of the range of selected alternatives accords with the aspect of creativity, of more or less ample exploration of the field, we could provisionally hypothesize the presence in each individual of two opposing tendencies, the balance of which is indispensable for understanding: on the one hand, the tendency to persevere<sup>14</sup>, and on the other, an exploratory tendency that we could define as the mental "combinatorics" of all possibilities.

These two tendencies would essentially be two different ways of directing the "flow" or "course" of thought or behavior or, to repeat the terms already used in our previous work (Greco, 1979), of the "modulation" of a continuous source of information. The two possibilities are obviously two extreme hypotheses. In the first case (perseveration) the state of the system is always left unchanged; in the opposite case (exploration or combinatorics) there is a tendency to continuously vary this state.

The detection of the presence of something meaningful and its structuring arise from the breaking of uniformity, just as meaningful perception is possible only when it is possible to relate at least two *different* elements (Watzlawick, Beavin, & Jackson, 1967, p. 21). The "detection of diversity" is possible only through a cognitive act, which automatically specifies "which" it is. Therefore, it is evident that perseveration is not so much the immutable, linear flow of a state always equal to itself (the relation of equality can be perceived only through diversity), but rather will take the form, circular, of a succession of "equals" cognitively identified as such through a break

<sup>13</sup> It should be noted that many recent experimental investigations agree that perceptual and linguistic-conceptual organization are analogous, i.e., they consist of categorical structures (Reed, Friedman, 1973). This is supportive of our hypothesis that considers expressive facts to be cognitive facts.

<sup>14</sup> "Perseveration" is, according to Murphy & Spohn (1951) «1) the tendency of an idea to return without associative or apparent stimulus; 2) more generally, the tendency to continue an activity once begun». As can be seen, the concept can be applied to both consciousness and behavior.

in the undifferentiated or linear state of thought, that is, through the introduction of "diversity" that determines discontinuity and thus structure.<sup>15</sup>

From an ontogenetic point of view, something similar happens. In the cognitive development of the child, this mechanism is evident in the gradual establishment of the "circular reactions" described by Piaget, and in the affective development in the establishment of the "object relations" described by the English school of psychoanalysis. Circular reactions are essentially the introduction of signification and structuring into a state of undifferentiated thought the rupture of that state with novelty, stimulation, etc. From the affective point of view, object relations constitute the structuring of a world of "internal objects" which are the actualization, as "internal presences", of the absence of external objects. That is, there is the rupture of the primitive state of *absence* of the object and the introduction of discontinuity with the *presence* of an internal object<sup>16</sup>.

Fairbairn (1952) and Guntrip (1961), have argued that interpersonal communication is a relating to others through the re-actualization of "internal objects". This point of view is also interesting because it implicitly<sup>17</sup> points out that the structuring of the understanding of meanings is possible starting from the "presences" that, so to speak, we have inside us, or - in other words - from the aggregation of "different" psychic states, originally created by "presence", into structures or patterns that identify invariants.

If the "detection of diversity" is essentially the formulation of a hypothesis of differentiation, or the choice of an alternative for the next state, we see that the attitude we have called "combinatory" is the stimulus for the more analytical differentiation, which proceeds by "scanning" all possibilities. This tendency could just as well be called "exploratory", not in the common sense of this term in psychology - referring to the external environment - but in the sense of relating it to the "internal" environment. Such a mechanism is consciously perceptible when trying to understand a difficult text and manifests itself in the conscious use of all associations, in the attempt to evaluate all possibilities, and so on.

#### 4. Understanding in interpersonal relationships

At this point, if we take into account the considerations made above, we can define interpersonal understanding as a cognitive process of differentiation of meanings, which takes place in intersubjective situations of communication but which is analogous to the process through which one comes to the identification of a meaning "for oneself". The choices made, consciously or unconsciously, by the subject make the differentiation of consciousness or behavior acquire a direction, an orientation, a "sense". It is not by chance, perhaps, that the term "sense" has the double connotation of "direction" and "meaning".

If what guides differentiation are choices, these choices are explained or in some way motivated by implicit ideas, which are not thinkable in the course of the differentiation they control, but are only evidenced by a dedicated act of knowledge, i.e., through a different differentiation.<sup>18</sup>

These implicit ideas that control or regulate the development of other ideas or significant behaviors can be defined by a very wide range of terms, more or less equivalent depending on the particular aspects that are emphasized: rules, norms, parameters, instructions, programs, plans, codes, etc. The concepts of "rules" and "norms" are typical of linguistics, while those of "instructions", "programs", etc. are typical of cybernetics. It was the use of computers that revealed the need for a sequence of auxiliary information, which serve to control the processing of other information (the main information).

The term "plans," in particular, has been used - as is well known - by Miller, Galanter, & Pribram (1960) to denote a set of rules that structure all behavior. Chomsky and Miller (1969), as noted, suggest a generalization of the theory of grammatical structure "as a schema for theories of other kinds of complicated human behavior". "Plans" i.e., a hierarchical system of "TOTE" (Test-Operation-Test-Exit) units, are "objects that can be formed and transformed according to defined rules" (*ibid.*, p. 374).

The rules we are talking about can be described as ideas that are able to control differentiation also in a retroactive form (feedback), both in a negative and positive sense (to decrease or increase deviations from a fixed standard). Through their use it is possible to retroactively "know" if what has been said corresponds to what was intended to be said and to correct the differentiation accordingly (negative feedback), but they also have a con-

---

<sup>15</sup> The "brooding", the obsessive and coercive thinking with the "inevitable" presence of the same meaningful sequence, the "compulsion to repeat" described by Freud, are all examples of coercive structuring in which differentiation occurs in a circular way, the final point of the cycle being also the starting point of a subsequent cycle.

<sup>16</sup> A stimulating contribution concerning the function of presence or absence, as well as negation, was made by Wilden (1972). According to this author, absence, as well as the "empty set" in set theory, cannot be "nothing" but is a rule concerning the way to consider what is present or the interrelations between sets. Similarly, negation (impossible, as we know, in analogical language: cf. Watzlawick et al., 1967), is always the exclusion of "something".

<sup>17</sup> These considerations were not made explicitly by these authors, whose fundamental interest relates to the derivation of such presences from interpersonal relationships rather than biological processes.

<sup>18</sup> The act through which one comes to become aware of the processes implicit in a cognitive act can be defined as "metacognitive" (Greco, 1978).

structive structuring function (positive feedback): this is the case when the choice of a name for a feeling or emotion experienced affects the development of *that* very feeling.

This progressive "self-convincing" is similar to the mechanism of formation "of emotion as hypothesized by the well-known theory of Arnold and Lindsley (Lindsley, 1951). It is possible to extend this hypothesis to the development of all meanings and not only affective ones. Arnold and Lindsley hypothesized an "emotional stance" at the cortical level from which develops the spherical expression that, returning to the cortex, reinforces the stance. If we leave the neuro-physiological setting, the same phenomenon can be expressed by saying that the undifferentiated arousal generates a stance (which we can define both emotional and cognitive, in different parts depending on the situation) that will be differentiated in some direction; the information related to this direction, in turn, returning back to the processing center, will influence subsequent choices.

This progressive "self-conviction" is similar to the mechanism of "snowball" formation of emotion as hypothesized by the well-known theory of Arnold and Lindsley (Lindsley, 1951). It is possible to extend this hypothesis to the development of all meanings and not only affective ones. Arnold and Lindsley hypothesized an "emotional stance" at the cortical level from which develops the peripheral expression that, returning to the cortex, reinforces the stance. If we leave the neuro-physiological setting, the same phenomenon can be expressed by saying that the undifferentiated arousal generates a stance (which we can likely define both emotional and cognitive, in different parts depending on the case) that will be differentiated in some direction; the information related to this direction, in turn, returning back to the processing center, will influence subsequent choices.

The influence of external or contextual factors, also of a cognitive nature, on the development and awareness of emotions, would also be demonstrated by the experiments conducted by Schachter & Singer (1962) at Columbia University in the United States. In the same circumstances of activation by noradrenaline, the labels attributed to the arousal varied surprisingly according to the context or in any case to the knowledge of the situation that the subjects had: in our terms, the same state was differentiated differently depending on the criteria, rules or parameters adopted.

It is interesting to remark that the influence of the context can be considered inversely proportional to the degree of differentiation. It is precisely in the case of the event encoded in an undifferentiated way that the interpretation is more dependent on the context and cannot do without specifications or additional information. In the psychological literature of the last years we find accounts of other experiments that converge in indicating the relevance of the contextual component in the attribution of meaning (knowledge of the situation, possibility of justification, "consonance" with certain conditions already known, and so on).<sup>19</sup>

## 5. The Context

According to our proposal, the achievement of some differentiation, first for oneself, and then in interaction with others, is an active process of construction. The starting point of differentiation depends to the greatest extent, of course, on the intrinsic structure of *the input* (state of the external environment, internal neurophysiological conditions), but the path that differentiation will take depends above all on those implicit ideas that we have called rules or parameters and, simultaneously, on the initial conditions of the *input*.

Using a term that in linguistic theory indicates the extralinguistic factors that influence the issuance of an expression, we group under the denomination of "context" all the factors that influence differentiation (the "why precisely that"), excluding the mechanisms inherent to the same differentiation (the "how"), although the two aspects appear obviously related.

Some factors influence differentiation by acting as a source of *input* (states of the environment outside or inside the organism), others relate only to the evolution of meaning. That the input has its own initial structure is indisputable: it is not possible to arbitrarily affirm anything about the environment, whether external or internal to us. That there is a table in front of me or that I am aroused is indisputable; the constructive differentiation of thought can determine how clear it is to me that it is indeed a "table" or the name I will give to my arousal. Similarly, in interpersonal understanding, a behavior or message has its own unambiguous physical reality, although it then depends on our differentiation what "meaning" we will give it.

The importance of context has always been emphasized by language scholars, from whatever perspective they have placed themselves. For example, the semiologist Prieto (Prieto & Martinet, 1964) believed that to understand a meaning is to make "relevant" (i.e., to specify) traits or characteristics that are part of the contextual circumstances in which a message is presented.

To conclusions similar to those of Prieto, although without direct relation to that author, came Olson (1970) who, together with the results of some psychological experiments on the effect of contextual variables in expression, presented a "cognitive theory of semantics." According to Olson, a semantic decision, such as the choice of

---

<sup>19</sup> An example may be the ingenious experiment of Valins and Ray, reported by Nisbett & Wilson (1977), in which subjects were convinced that they were not afraid of snakes because they received a false feed-back of their heartbeats simultaneously with the presentation of fearful images, a feed-back conveniently rigged by the experimenter.

an expression, is made in such a way as to differentiate the referent being targeted from a set of "perceived or inferred" alternatives present in the context.<sup>20</sup>

This is another example of the way in which, from the "knowledge" of the meaning one aims at, one moves to its expression. Semantic decisions, even when made "for oneself", cause one idea to differ from others in accordance with contextual factors (what one knows about the situation in which one finds oneself, the emergence of unconscious drives, etc.).

Another contextual aspect is the set of psychological capacities necessary for the presence of an "input" to occur. For example, the semantic memory, in the sense of deposit or repertoire (whose function is active or dynamic) of linguistic terms or models of verbal or behavioral construction. The relevance of these aspects is particularly evident if we consider the inability or difficulty of structuring that children or subjects in pathological conditions have.

## 6. Some conclusions

In the course of this work we have presented some proposals for conceptual definitions and examined some hypotheses about the ways in which information is selected and processed, and in particular we have attempted to address the problem of how such information comes to be considered meaningful, to be expressed in intersubjective co-communication and, again, to become meaningful again. Since it seems that the clarity of meaning and the complexity of structuring may be different at the initial and final moments of the encoding process, we have spoken of this process in terms of a "differentiation". The process of differentiation consists of a selection of input by attention and the choice of different successive inputs, depending on both coercion by contextual factors, accommodation in hierarchically-structured categories, and a balance between the tendency to perseveration and the tendency to combinatorial exploration.

At this point we can highlight how a model concerning individual cognitive activity can be usefully extended to interpersonal comprehension and we can outline more precisely what the isomorphism between the process of expression and the process of interpretation of a message, discussed in the work preceding this one (Greco, 1979), consists of.

Interpersonal communication exchanges between two subjects (A, transmitter - B, receiver) could be considered as consisting of: 1) a process of encoding-differentiation of content in the consciousness of subject A; 2) a simultaneous process of differentiation of his behavior; 3) a similar process of differentiation by subject B. Both subjects will select a particular set of meaningful contents, which may be similar for both, provided that the process is subject to the action of the same contextual factors that function as rules or norms of structuring meaning both for themselves and for others. If, however, we could make explicit as much as possible the structuring norms that indicate the meaning to be attributed to particular inputs, or the way to relate the various inputs and select them with attention, we might have a key to make certain apparently only subjective "experiences" intersubjective.

Interpersonal communication exchanges between two subjects (A, transmitter - B, receiver) could be considered as consisting of: 1) a process of content encoding-differentiation in the consciousness of subject A; 2) a simultaneous process of differentiation in his behavior; 3) an analogous process of differentiation by subject B. Both subjects will select a particular set of meaningful contents, which can be analogous for both as long as the process is subjected to the action of the same contextual factors that function as rules or norms of structuring meaning both for themselves and for others. If, therefore, one were able to make as explicit as possible the structuring norms that indicate the meaning to be attributed to particular "inputs", or the way of relating the various "inputs" and selecting them with attention, one might have a key to making intersubjective certain "experiences" apparently only subjective.

We can therefore consider the differentiation of meanings in consciousness as the central reference point of the comprehension process, that is, as the starting point of every encoding and the finishing point of every decoding. Between the two terminal moments, the intermediate step capable of transmitting information from one individual to another (and that perhaps, in the same individual, acts as a catalyzer between the initial and final moment of differentiation) will be the structuring of behavior that occurs, automatically or voluntarily, in conjunction with that of consciousness. Understanding, at least in the paradigmatic cases, would then occur as a result of an isomorphism in the differentiation of two subjects: the first, in differentiating a meaning "for himself" will introduce (intentionally or unconsciously) selective modifications in his behavior, modifications that will be typical of a certain type. This peculiar structuring will lead the other subject to differentiate his perception in the same sense.

Considering the intersubjectivity of communication and understanding as based on an isomorphism in the implementation of the differentiation process, it is clearer why it is commonly believed that communication

---

<sup>20</sup> We agree with all the points proposed by Olson, but we are perplexed by his conclusions on the relationship between thought and language. According to Olson, language has no influence on thought, much less structure it, being merely redundant with it (uttering a sentence does not give information to the speaker but only to the listener). In our opinion, these conclusions do not take into account the fact that the expression is a process of construction and that what is expressed returns to the subject who expresses and influences the expressions that follow.

achieves a higher degree of "understandability" when talking about physical and observable facts.

For example, why is it that when another man tells us that he feels fear, or tenderness, or toothache, that he feels a fever or a bitter taste, we "understand" what he means, but we may not be entirely sure, and instead we have a higher degree of confidence that we "get it" when he tells us that he thinks his body temperature is 38° C or that aspirin is composed of acetylsalicylic acid?

In both cases the information we have about the "internal" state is neither greater nor lesser: only, in the second case, we have more differentiated information, i.e. the language we use is more structured and "covers" narrower areas accessible to our cognitive activities with more ease because there are fewer differentiation alternatives.

In reality, the degree of intersubjective intelligibility of a behavior, and in particular of a linguistic expression, does not depend on whether it refers to physical facts or facts external to the individual, but rather on the existence of sufficient contextual factors that allow differentiation in a given sense, with little or no alternative possibilities. This case is more likely to occur when dealing with external events, such as physical facts, but it is possible for an expression relating to internal facts to be accompanied by more contextual elements of differentiation than an expression relating to the perception of external stimuli. Such an expression related to the "internal" world can therefore be completely objective, because in the moment in which the subject chooses an expression, precise and structured, which is part of a commonly accepted code, he automatically differentiates his own perception in a certain sense.

Everyone knows that the most "incomprehensible" experiences seem to be those of psychotic individuals who are excessively closed in their world, or, as it is said, in their "autism". Such individuals confuse what is subjectively conceived with objective perceptions and therefore express themselves in a code that is valid only for themselves, and which is elusive. At the opposite extreme, from the point of view of the centrality of one's own experiences in the expression, one could think of "depersonalization", that is to say, an overtaking of environmental conditions and impositions, such as to cancel any residue of subjectivity. "Normal" communications could be located at the center of this continuum, between autism and depersonalization.

If we want to study an expression that in the continuum is at the first extreme, we will find ourselves without criteria of differentiation and, indeed, it will be impossible to say anything about absolutely private mental states. Understanding the schizophrenic world seems so difficult not because it is undifferentiated and vague, but because it functions with criteria of differentiation of reality that are different from the common ones.

On the other hand, a hypothetical depersonalized individual, who would act randomly (excluding unconscious motivations or environmental coercion) without being aware of what he does and why he does it, would not present a behavior "understandable" by someone. It is clear that the first assumption in order to attribute a sense to a behavior is that it has a sense for the individual who performs it. Even when, speaking of "depersonalization", we mean a behavior that expresses instances not of the subject but of a coercive environment, the conditions that allow to use appropriately the term "behavior" in this case would lack (Greco, 1979).

In most cases, toward the middle of the continuum, there will not be a mixture of "elusive personal aspects" and "social aspects," as would seem intuitive. Thought is possible only insofar as there are social devices, such as language or nonverbal codes, that allow it to be differentiated. To the extent that an experience is not comprehensible and describable by an individual, it is not comprehensible to anyone. But when it is differentiated and described in verbal terms, it means that one has adhered to a certain code, to a "norm" of differentiation, and it is no longer possible to question it.

When a person claims to "feel sad", there should be no reason to wonder if their sadness is the same as mine, just as there is no point in wondering if the red seen by others is the same red that I see. If there are individual differences in the attribution of the label "red" or "sadness" to certain psychic events, they are not commensurable. However, when a person, in the jumble of his own feelings, chooses and says (and convinces himself) that he feels a certain feeling, he has differentiated his own psychic state, and from that moment he has made it adherent to an intersubjective code that is also valid for himself.

A person can choose between different terms to indicate emotions and differentiate them from each other when they are imbricated, just as only through language can come to perform complex operations of abstraction, can grasp mathematical relationships, etc.

The problem that has always arisen has been determined by the fact that it is usually believed that we start from a prelinguistic experience, about which the individual cannot say anything (or which, in any case, when the individual talks about it, has already been transformed and therefore cannot be generalized to other individuals).

Prelinguistic experience, on the other hand, should not be considered almost something mystical or non-mental, but merely an undifferentiated presence to consciousness, just as the intuition of the solution of a mathematical problem might be before it is expressed in detailed form in its various steps. Individual experience is a datum for the subject who experiences it and therefore individual and personal theories based on introspection could be accepted in explaining behavior (Mandler, 1975).

Interpersonal understanding, in this way, would become something relative to the criteria by which subjective experience is differentiated. Psychology does not provide us with a system for being certain that we have achieved understanding, but it can lead us to conclude that such a certainty from a certain point of view can never exist and from another point of view will always exist.

In a chain of events linked by a causal link to say which is "the" determinant in which explanation depends on what is more *relevant* in relation to a certain point of view. In the same way, the understanding of someone else's expression will never be the "correct" one if we do not know what we are looking for, i.e. what criteria to adopt to interpret it, but - once we have chosen a set of criteria - it will always be the "correct" one, even if relative to those criteria.

If two subjects agree to specify contextual criteria for differentiation and choice, understanding can reach into the most intimate nuances. Novelists, after all, have always specified in their descriptions a series of contextual elements that provide the necessary information for understanding their characters. It should not be considered that such a work is far from scientific practice, because if the criteria are sufficiently precise an introspective account can be perceived as coercively as a physical fact.

In conclusion, the hypotheses we have proposed seem to us to constitute a theoretical framework that suggests further systematizations. In particular, it seems to us fruitful to use in the investigation of interpersonal understanding models that attempt to account for knowledge activities. Research on cognitive processes and research on communication in contemporary psychology follow two mostly distinct lines. This allows - it is true - a specific deepening of particular aspects of the two problems, but it is thus lost the possibility of devising experimental situations of interpersonal interaction that take into account the ways in which we come to differentiate meanings for ourselves or, vice versa, to carry out investigations on the selection or memorization of the "input" taking into account the fact that not all "inputs" are equal and that the behaviors-communications of other human beings are privileged stimuli.

### References

- Bartlett F. C., *Remembering*, Cambridge University Press, London, 1932.
- Berlyne D. E., *Conflict, arousal, and curiosity*, Mc Graw-Hill, New York, 1960.
- Bertalanffy (von) L., *General System Theory*, Braziller, New York, 1968.
- Cowdry, E.V., *Cancer cells*. WB Saunders, 1955.
- Boyle, D. G., *Language and Thinking in Human Development*, London, Hutchinson, 1971.
- Broadbent D.E., *Perception and communication*, Pergamon Press, London, 1958.
- Broadbent D.E., *Decision and stress*, Academic Press, London-New York, 1971.
- Bruner J. S., *A study of thinking*, Wiley & Sons, New York 1956.
- Chomsky N., Miller G.A., Finitary models of language users, In D. Luce (ed.), *Handbook of Mathematical Psychology*. John Wiley & Sons., pp. 2-419, 1963.
- Collins A. M., Quillian M. R., Retrieval time from semantic memory, *J. Verb. Learn. Verb. Behav.*, 1969, 240-248.
- Fairbairn, W.R.D. (1952). *Psychoanalytic Studies of the Personality*. London: Routledge & Kegan Paul
- Fraisse P., Why is naming longer than reading?, *Acta Psychologica*, 30, 1969, 96-103.
- Greco A., Il problema del significato come problema cognitivo, in A.A. V.V., *Studi sul problema del significato*, Le Monnier, Firenze, 1978 (English translation available soon).
- Greco A., L'approccio cognitivo al processo di comprensione interpersonale: ruolo dei concetti di "coscienza e comportamento", in *Studi di psicologia*, Vita e Pensiero, Milano 1979, pp. 91- 111. English translation: [The cognitive approach to the process of interpersonal understanding](#).
- Guntrip H., *Personality Structure and Human Interaction: The Developing Synthesis of Psychodynamic Theory*, Karnac Books, 1961.
- Lambert W.E., Jakobovits L.A., Verbal satiation and changes in intensity of meaning, *J. of experim. psychol.*, 60, 1960, 376-383.
- Lewin, K. *A dynamic theory of personality*. McGraw-Hill, 1935.
- Lindsley D.B., *Emotion*, in Stevens S.S.(Ed.), *Handbook of experimental psychology*, Wiley & Sons, New York, 1951, pp. 473-516.

- Mandler G., Consciousness: respectable, useful, and probably necessary, in Solso (Ed.), *Information processing and cognition*, The Loyola Symposium, Wiley & Sons, New York 1975, pp. 229- 254.
- Matte Blanco I., *The unconscious as infinite sets*, Duckworth, London, 1974.
- Mervis, C.B., Catlin J., and Rosch E., Development of the structure of color categories. *Developmental psychology*, 11,1, 1975, 54-60.
- Miller G. A., Galanter E., Pribram K. H., *Plans and structure of behavior*, Routledge.
- Murphy G., Spohn, H., *An Introduction to Psychology*, Harper, 1951.
- Newell, A., Shaw, J. C., & Simon, H. A. The processes of creative thinking. In H. E. Gruber, G. Terrell, & M. Wertheimer (Eds.), *Contemporary approaches to creative thinking: A symposium held at the University of Colorado* (pp. 63–119). Atherton Press, 1962.
- Nisbett R.E., Wilson T.D., Telling more than we know: verbal reports on mental processes, *Psychol. Rev.*, 84, 3, 1977, 231-259.
- Norman D.A., Toward a theory of memory and attention, *Psychol. Rev.*, 75, 6, 1968, 522- 536.
- Norman D. A., *Memory and attention*, Wiley & Sons, New York 1969.
- Olson D.R., Language and thought: aspects of a cognitive theory of semantics, *Psychol. Rev.*, 77, 4, 1970, 257- 273.
- Paivio A., *Imagery and verbal processes*, Holt, Rinehart & Winston, New York, 1971.
- Piaget J., *La construction du réel chez l'enfant*, Delachaux et Niestlé, Neuchatel-Paris, 1937.
- Piaget, J., *La formation du symbole chez l'enfant: imitation, jeu et rêve*. Delachaux et Niestlé, 1946.
- Prieto, L.J., & Martinet A., Principes de noologie, *Les Etudes Philosophiques*, 20,3, 1964.
- Reed S.K., & Friedman M.P., Perceptual vs. conceptual categorization. *Memory & Cognition*, 1, 2, 1973, 157 -163.
- Rosch E., On the internal structure of perceptual and semantic categories, in Moore T.E. (Ed.), *Cognitive development and the acquisition of language*, Academic Press, New York, 1973, 111-144.
- Rosch E., Cognitive representation of semantic categories, *J. Experiment. Psychol.: General*, 104, 3, 1975, 192-233.
- Schachter S., & Singer J.E., Cognitive, social and physiological determinants of emotional state, *Psychol. Rev.*, 1, 69, 1962, 379-399.
- Schilder P., *The image and appearance of the human body*, International Universities Press, New York, 1950.
- Sperling G.A., Successive approximations to a model of short-term memory, *Acta Psychologica*, 27, 1967, 285- 292.
- Treisman A.M., Verbal cues, language and meaning in selective attention, *Amer. J. of Psychol.*, 77, 1964, 206-219.
- Watzlawick P., Beavin J. H., & Jackson D. D., *Pragmatic of human communication*, Norton, New York 1967.
- Werner, H., *Comparative psychology of mental development*. Follett Pub. Co., 1948.
- Werner H., The concept of development from a comparative and organismic point of view, in Harris D., *The concept of development*, Univ. of Minnesota Press, Minneapolis, 1957, 125-148.
- Wilden A., Analog and digital communication: on the relationship between negation, signification and the emergence of the discrete element, *Semiotica*, VI, 1, 1972, 50- 82.
- Witkin, H.A., Dyk, R.B., Fattuson, H.F., Goodenough, D.R., & Karp, S.A., *Psychological differentiation: Studies of development*, Wiley & Sons, New York, 1962.