Pragmatic and Cognitive Presuppositions Across Discourse Spheres

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> **An hour sitting with a pretty girl on a park bench passes in a minute, but a minute sitting on a hot stove seems like an hour**.
> (*The New Quotable Einstein*, Princeton U.P.)

1. Introduction

The paper suggests that pragmatic and cognitive presuppositions (henceforth presuppositions) are major factors of the dialectic process whereby participants in a speech event generate meaning through language appropriate to the epistemic world of the interactants, context of situation and purpose of the exchange. It associates this category with "… a background of beliefs or assumptions which are shared by the speaker and his audience and which are recognised by them to be so shared" (Stalnaker 1999:48).

The concept of presupposition has been extensively discussed in Pragmatics. However, its definition has been based "…closely on the actual linguistic structure of sentences" (Levinson 1987: 167). Cognitive and operative strands shared by the interlocutors as well as other 'conditions' accompanying utterances related to the physical world, human experience and artifacts remain under-emphasised in the discussions. Even studies affiliated to theories of pragmatic presupposition which have enriched the debate with the notion of 'common ground knowledge' remain anchored to the grammatico-semantic content of single sentences. On the one hand, the analyses make no reference "… to the body of information that is presumed to be available to the participants in the speech situation, or to the attitude and intentions of the speaker and his audience" (Stalnaker 1999:48). On the other, they leave unexplored the influence that presuppositions can have on the articulation and interpretation of coherent stretches of discourse.

The present study, first, traces the historic foundation of the concept of presupposition. Next, it attempts a brief overview of current descriptive models of the category. Then, it identifies and describes the presuppositions contributing to actual texts from different spheres of discourse: a piece of ordinary conversation, a scientific report and a novel.

The working hypothesis is that, in order that communication be achieved, the participants must work collaboratively towards a common goal. This task presupposes sharing a linguistic system along with stored content-related utterances which can help to grasp, compare, associate and evaluate new input (cf. Bakhtin 1996). In this perspective, presuppositions encompass the epistemic, practical, socio-cultural and linguistic patterns shared by addresser and addressee. These extra-textual epistemic strands determine domain restriction of meaning and characterise distinctive genre types. The discussion invites the suggestion that a more comprehensive analysis of the category would be fruitful in linguistic research areas. The investigation could favour a better definition of how presuppositions contribute to the articulation of speech and favour distinctive interpretation of texts resulting to 'responsive understanding'. In language for specific purposes (LSP) studies, this awareness could enrich theoretical and methodological discussions and bring about more adequate descriptive models of discourse in action.

2. In pursuit of a theory

Pragmatic and cognitive presuppositions, or beliefs, assumptions and extra-linguistic knowledge shared by the participants in a speech event, have been implicit in discussions on the sources and nature of meaning since classical times. In *The Nicomachean Ethics (NE)* (1998), Aristotle (384-322) questions Platonic eternal 'forms' as ultimate sources of knowledge and meaning. He argues that the immediate real world, as perceived by our senses, supplies samples of the things we can talk about. He reasons that the relationship between words, processes of the real world, natural and man-made objects is only indirect and mediated through the human mind.

Aristotle clarifies his stance by relating to arguments he had discussed in two of his previous essays on pragmatics and the philosophy of language. In the first, the philosopher/scientist reasons that the properties of the physical world are similar in the different geographical areas and, thus, independent of the languages spoken by the inhabitants of each region. He considers the role that names have in identifying people, animals and objects. Then, he explains that names as well as language systems are products of conventions elaborated by the different communities of practices which contribute to the social welfare of the city-state. Thereafter, he considers the interrelation between speech and writing and underlines the role of the human mind in both activities. Thus, he introduces the concept of schemata:

Spoken sounds are symbols of impressions in the mind, and what is written are symbols of what is spoken. Speech, like writing, is not the same for all mankind,

74

although the mental impressions directly expressed by these signs are the same for all, as are the things of which these mental impressions are likenesses (Aristotle 1924: De Interpretatione I).

In the second essay, Aristotle discusses the sources of meaning and the functions of words in the articulation of rational thought. He proposes a model and definition of the semantic, cognitive and pragmatic categories, or *topoi,* involved in the process. These include notions of sense, reference and selective patterns. Hence, their identification anticipates modern artificial intelligence theories of 'frame' structures. Aristotle explains his model dynamic as follows:

Each uncombined word or expression means one of the following things: - what (or Substances), how large (that is Quantity), what sort of thing (that is Quality), related to what (or Relation), where (that is Place), when (or Time), in what attitude (Posture, Position), how circumstanced (State or Condition), how active, what doing (or Action), how passive, what suffering (Affection) (Aristotle 1924: Categories IV).

The categories presented in the passage can be exemplified through the description of a subatomic entity:

What	Electron
Quantity	mass of $9.109\ 3897(54) \times 10^{-31}$ Kg
Quality	negatively charged
Related to what	elementary particle
Where	atom
When	always
In what attitude	stable
State/condition	at rest or excited
Action	Electromagnetic and weak interaction
Affection	can be both active and passive

In the *NE*, Aristotle corroborates his theory that meaning is in relation to knowledge, action, experience and purposes of communities of thought and practices. The categories which define the electron can confirm this stance. The language used in the description is English, but only nuclear physicists can evaluate whether the definition is adequate, the linguistic forms appropriate, and the utterance true to facts. If necessary, they can also update the content according to new experimental and theoretical data.

The philosopher/scientist acknowledges the importance of verbal forms in social, economic and academic communication, but he states that every assertion as well as every knowledge field builds on previous knowledge. He adds that every advancement depends on hard work and dedication by people interested in solving problems related to specific trades and arts. Then he continues by emphasising the relative nature of every activity, knowledge and meaning. He reasons that in every

field of work and study, progress is achieved by degrees, hence, no one can aspire at completeness: "… we must not look for precision in all things alike, but in each class of things such precision as accords with the subject matter, as so much as appropriate to the inquiry" (Aristotle 1998:1098^a 25-27). Thus, he links the quality of a product of a trade, art or science not only to the mental abilities and manual skills of each community member, but also to the models, materials and instruments available at a specific time and place.

Aristotle argues for a descriptive model of the communication process which emphasises human agency, attitudes and intentions. He explains that individuals use concepts, theories and artifacts in relation to specific interests and purposes: "For a carpenter and a geometer investigate the right angle in different ways; the former does so in so far as the right angle is useful for his work, while the latter inquires what it is or what sort of thing it is; for he is a spectator of the truth." (Aristotle1998: 1098^a 27-30). He proposes a relativistic conception of socio-political, economic and linguistic values. He reasons that the notions of 'truth' and 'justice' depend on the circumstances, context of culture and context of situation of action and event, thus, they cannot be given absolute value. Accordingly, he suggests that even opposite terms such as 'rational' and 'irrational' should be considered relative and not be framed as if they were separable entities. He explains that the two concepts "… are distinct by definition but by nature inseparable, like convex and concave in the circumference of a circle …" (Aristotle1998: 1102^a 35-38).

Aristotle maintains that activities and speech are not uniform throughout society, but that the communities of practices are interdependent. The physician needs the services of the shoe maker and vice versa, to interact with one another the two parties must use a packet of shared concepts and expressions. However, the socio-economic interaction does not require that the interlocutors have full familiarity with the repertoire of concepts, practices and meanings of each other's trade. Aristotle argues for a relativistic but organic definition of meaning which should encompass the interactants, their social and epistemic worlds, related activities, instruments, objects as well as the time, place and purpose of the speech event.

Aristotle's discussions and teachings have been fundamental for the development of Western thought, culture and science. His epistemico-pragmatic approach to the sources of meaning and communication has been analysed and elaborated by rhetoricians, linguists, philosophers of language and pragmatists through the different ages. However, his arguments for the inclusion of human agency, the mind, the external world and the presuppositions shared by interactants have not yet been fully incorporated in language studies.

In modern times, the role of cognitive and pragmatic variables in establishing meaning and communication has been forcefully debated. G. Frege (1977) re-proposes the issue and underlines the influence of presuppositions on discourse formation and processing. He describes the category as stratified and acting at the

three canonical levels of language: grammar (the sentence), semantic (the statement), pragmatic (speaker and actions). He then defines the concept as "….the knowledge of certain conditions accompanying the utterance which are used as means of expressing the thought,…" (Frege 1977:10-11). According to Frege, presuppositions shared by interlocutors establish the circumstances both to advance from 'sense' to 'reference' and to evaluate the truth value of an assertion.

C. S. Peirce (1923) defines communication as a complex system of semiotic and pragmatic interactions. He argues that the main components of this system are **signs** (verbal and non-verbal codes), **objects** (the entity/topic/theme being discussed) and the **interpretants** (the interactants). According to Peirce, effective communication rests on a dialectic process between active participants. To communicate, the latter must share knowledge of the language code, of the subject matter as well as of ways to articulate discourse. When this requirement is satisfied, the discursive interaction becomes a discovery process which can contribute to extend the knowledge store of the parties involved in the speech event. However, especially in field-related speech events, the heuristic experience requires that the 'interpretants' share a common background encompassing appropriate and univocal terminology, current models of representation, established facts, theories, beliefs and interests of the research community.

I. A. Richards (1923) argues that speech organisation and understanding, besides familiarity with a language system and its mechanics, depend on direct experience in a universe of discourse. He states that the utterances relevant to the specific context feature "…a recurrent set of mental events, peculiarly related to one another, so as to recur, as regards their main features with partial uniformity" (Richards 1923: 57). Richards considers clusters of concepts as the source of recognition, inference and other thinking strategies which make possible the encoding and decoding processes. In this scenario, the cognitive context determines the retrieval and monitoring of information underlying the 'feedforward' and 'feedback' operations which contribute to meaningful oral and written exchanges. Richards explains that: "Our ability to select meanings similar to those envisioned by the source is dependent on our past experience and choices of meaning from those experiences; feedforward prepares us to attribute particular meaning rather than others" (Richards 1976:250). The 'feedback' operation gives effect to a dual activity, it confirms the patterns anticipated in the 'feedforward' phase and supports the re-use of expressions and concepts, in similar speech circumstances, in the future. The communication process is thus dialectical and evolutionary. It bridges the world of the source to that of the recipient with consequent influence of the text on the receiver and effects of the receiver on the text.

B. Malinowski (1923) shares Richards's view of the constituents of communication and suggests a description of speech in action so as to explore the meaning of words rooted in their pragmatic efficiency (Malinowski 1923:297). The often-quoted ethno-linguist argues for the inclusion of agents, activities, actions, contexts of situation and culture in describing speech events. He suggests that without the

inclusion of this background, discussions about language and communication frame meaning as if spun out of empty words. He proposes a holistic and dynamic approach to language studies whereby spoken and written statements are described '*in fluxo*': in consideration of the things to be expressed, the activities being performed, the interactants' cultural, social and economic conditions (Malinowski 1923:309).

M. Bakhtin (1996) expands Aristotle's argument that the nature and forms of language use are just as diverse as are the areas of human activity. He introduces the concept of discourse spheres and terms the minimal units composing speech genres 'utterances'. He explains that any utterance is a link in a very complexly organised chain of other utterances (Bakhtin 1996:69). Bakhtin states that every speaker builds his/her presentation drawing on preceding utterances produced by himself or others. He terms the process "intertextuality", that is, a body of relevant information or webs of representations familiar both to the source and recipient of the message due to experience with previous texts featuring similar themes. The philosopher of language insists that the articulation and understanding of speech presuppose not only the knowledge of the language system but also familiarity with extra-linguistic frames of reference appropriate to the specific discourse area.

In this perspective, Bakhtin draws attention to "… the very significant difference between primary-(simple) and secondary (complex) speech spheres …" (Bakhtin 1996:61, original parenthesis). In the first constellation or "repertoire of speech genres", he groups everyday communication, personal letters, popular tales, in the second, he includes scientific, economic, legal, socio-political, historical and literary prose and other disciplinary discourse realms. He specifies that the genres within the secondary speech constellation "… arise in more complex and comparatively highly developed and organised cultural communication" (Bakhtin 1996:62). He explains that awareness of both the state of the art and the requirements of the specific domain of discourse and action allows the source to evaluate his/her production while articulating speech. The very same insight helps the recipient to interact dynamically with the text by 'responsive understanding'. Bakhtin underlines the role that the competent reader/listener performs in the interpretative process. He suggests that during the epistemic activity, the addressee takes on the role of the addresser by evaluating, criticising, amending and expanding the content of the text.

J. L. Austin (1955) focuses on the role that speakers, conventions, rituals, social rules and actions can have in "*uttering words*" for successful communication. He explains that linguistic items are necessary, but not sufficient to perform successful and adequate speech acts. He then classes utterances into two broad categories: 'performatives' and 'constatives' speech acts. His model of analysis includes consideration of the grammatico-semantic content of sentences, of the participants' role and intentions, and of truth-conditional aspects of statements. Austin suggests that the unit of speech feature three-layers of information which he terms: locutionary, illocutionary and perlocutionary acts. The first relates to the language

structure, the second to the intention of the speaker and the third to the effect that the utterance can have on the addressee. He states:

> … it is always necessary that the circumstances in which the words are uttered should be in some way, or ways, appropriate, and it is very commonly necessary that either the speaker himself or other persons should also perform certain actions, whether 'physical' or 'mental' actions or even acts of uttering words (Austin 1955:8, original italics and single indentations).

Austin expands the arguments that speech should be analysed as an organic whole, situated in a context of culture, and described in the light of activities, intentions, motives and relationship of participants. He recognises the usefulness of sentences devised for grammar-logic studies, but defines them *parasitic* upon normal use and 'void' of actual meaning.

The discussions touched on above overtly or covertly assign presuppositions a significant role in the meaning generating process. In recent years, the debate has been expanded with contributions of many other scholars, who have argued "… in favour of a more dynamic view of the relationship between linguistic and non-linguistic dimensions of communicative events" (Duranti & Goodwin 1997:31). Ethnolinguists, cognitive linguists and LSP researchers have provided convincing arguments for the inclusion of people, mind, actions and related circumstances in the description of communication (cf. Langacker 1999). The model of analysis proposed by the discussants embeds complex sets of presupposition active both in the articulation and reception of discourse. It frames communication as an open-ended process which evolves through the netting of concepts, cultural practices, images, words and actions familiar to the interactants. The strands interweave in a complex texture similar to the honeycomb network shown in the following figure.
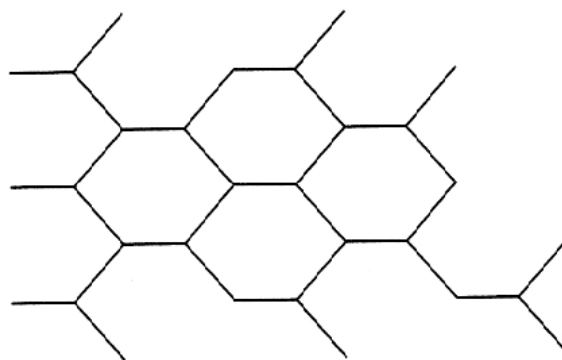
The participants in any speech event draw on sets of previous utterances, weave their spoken and written contribution by linking concepts, actions, practices and words according to context, intentions, purposes and accepted rhetorical patterns. In 'secondary speech genres', the network structure is even more relevant. In this sphere of thought and action, the source usually picks up the threads left loose by

previous discussants and then leaves the discussion strands open for other community members to continue the analysis and discovery enterprise. Common background knowledge is thus a determinant factor of this process (cf. Tarantino 2001).

3. Presuppositions in contemporary pragmatics

Arguments on the nature and role of presuppositions in ordinary conversation are a recurrent feature in pragmatic studies. The category has been extensively discussed and much information has been collected on the lexical items, grammatical particle and sentence structures that may act as presupposition triggers (cf. Levinson 1987). Different classes of presuppositions have been identified and labelled as *existential*, *definite*, *cleft*, according to linguistic constructions and logico-semantic content. Surprisingly, the suggestions for a holistic approach to the analysis of speech seem to have not been fully incorporated in the descriptive methods adopted. The models of investigation applied tend to under-emphasise the epistemico-pragmatic strands that link utterances in context of use, promote appropriate articulation of thought and lead to 'responsive understanding'. The category is usually identified through the analysis of single sentences such as:

> a- **All of John's children are in America.**
> b- **If it is raining, Peter will know.**
> c- **If James ever smoked, then at one time he smoked Luckies.**
> d- **It was Peter that Sara kissed.**

The explanations are of the tenor: '**a**' presupposes that John has children, '**b**' that it is raining, '**c**' that James smoked and '**d**' that Sara kissed someone.

The arguments and claims are interesting, but they are based mostly on logico-semantic considerations of sentence structures; little reference is made to the context of situation of the utterance, the non-linguistic circumstances shared by the interlocutors, their intentions and their characteristics: i. e., what they bring to the interaction. In addition, no mention is made about either the grounds for the assertion in sentences such as '**a**' and '**d**' or the conclusions packed in independent clauses as the ones of '**b**' and '**c**'. As a consequence, the sentences targeted for the analysis seem simultaneously to express and affirm the 'reality' of the content they should represent.

In a morpho-syntactic perspective, sentences such as '**b**' and '**c**' can be categorised as open or neutral conditionals since " … they leave unresolved the question of the fulfilment or non-fulfilment of the condition, and hence also of the truth of the proposition expressed by the matrix clause" (Quirk, Greenbaum, Leech & Svartvik 1985:1091). The clauses in question leave unresolved whether actually: 'it is raining', or 'James ever smoked' and, thus, also the conclusions: 'Peter knows' and 'James smoked' are arbitrary. If the statements draw on the speaker's judgement, and statistical or other data, then modality markers indicating assumption, expectations and/or other inductive or deductive strategies would seem necessary in

order to make the sentences possible samples of actual utterances. The specimens provided for the discussions seem contrived for the purpose and the explanation appear imposed on the structures. There is no denial that in ordinary speech, the factual truth of an assertion or the degree of certainty supposed or expected in uttering a conditional proposition may have little relevance. However, in scientific and other disciplinary discourse fields, the reporter is committed to signal these implications. Grice's (1975) co-operative principle and maxims of conversation seem to entail this guideline for effective use of language even in ordinary conversation.

Semantically generated sentence-meaning can have an important role in theoretical linguistic and philosophic studies. But these approaches tend to underplay the role of non-linguistic circumstances accompanying utterances and to constrain the range of possible interpretations that depend on the source, the recipient, the context , attitude and intentions of interlocutors. In so doing they crystallise concepts and limit the possibilities for further inferences and extensions of information. Recollection and extension of knowledge is supported by presuppositions (cf. Stalnaker 1999). Thus, the categorisation of the concept should be in the light of the semantic and epistemic strands of the category. This inclusion could make the concept less fluctuating and more resilient to objections by proponents of other descriptive paradigms (Levinson 1987).

The analysis which follows attempts to shift he focus of presupposition studies from 'micro-' to 'macro-pragmatic' analysis (cf. Lyons 1993). To this purpose, it trace the presupposition strands which allow participants in speech events, of different discourse spheres, to integrate stored schemata with pertinent conceptual and functional data. This dynamic operation allows them to assign meaning to utterances according to contextual and functional salience (cf. Lyons 1993). The discussion tries to find arguments in favour of more organic approaches to communication studies with particular attention to the LSP field. In this area of research and application, the need to enrich the forum of methodological discussion with concerns of the users' conceptual networks and their relationship with linguistic and rhetorical patterns remains paramount.

4. Shared patterns in 'primary speech'

Most of the studies on presuppositions have dealt with sentences in ordinary conversation settings. The text reported below is a dialogue recorded during an actual encounter. Hence, it falls within the same genre of the primary speech sphere.

Laura and Sara, two American friends, meet over coffee in an Italian café. While chatting, Sara, enthusiastically informs her friend:

S:-Last Wednesday, my friends married in grand style.
L:-Oh yeah?

S:-The bride wore a beautiful, white and pink, silk gown, the groom, a dark blue suit.
L:-Sounds beautiful.
S:-The bridesmaids sported green, taffeta gowns and the flower girls wore a miniature copy of the bride's gown.
L:-How interesting!
S:-The organist played inspiring music and the choir sang divinely.
L:-Really?
S:-The food and service at the '*Masseria*' were excellent.
L:-Where is this 'Masseria'?

The time reference locates the report in a shared time frame, while the qualified noun 'my friends' without further specification suggests that the 'reference to the subject' was shared by the interlocutors. Probably the couple and their future plans had been the topic of previous chats between the two ladies. The verb 'married' established the topic relevant to the conversation 'a wedding ceremony' and, according to shared context of culture of the interlocutors, triggers the presuppositions required to visualise the leading characters and other features of the ritual. The same process establishes the subconscious mechanism, whereby the listener, Laura, can advance from 'sense to reference'. Therefore, she can associate the word "gown" to the appropriate meaning:

(a) -a long, woman's dress for special occasions - and exclude the other senses:
(b) -a loose, flowing robe indicating professional status
(c) -a garment worn over clothes for protection.

Presuppositions also sustain the addressee's logical leap to frame a church setting, justified by the referents 'organist and choir'. The reference to the food and service triggers other schemata associated with wedding receptions. But, the Italian word, *Masseria*, requires an adjunct logico-semantic and contextual leap. Within the Apulian region of southern Italy, where the dialogue takes place, the original meaning of the noun is 'farm' and/or 'farmstead'. In the text, this meaning is overruled and the term transmits the notion of a fashionable rural restaurant which serves local products. In consideration of the actual context of culture where the conversation is taking place, other assumptions are in order. The bride and/or the groom must either be of Anglo-American extraction or have adopted an Anglo-Saxon bridal-party organisation.

In the wedding description, the presupposition inferences appear to also overrule grammar principles. No anaphoric reference exists in the text to justify the definite article which introduces the different characters and the activities mentioned. The shared schemata allow for both the retrieval of referents and economy of presentation with no meaning loss. The more formal or grammatically correct version:

> **- The flower girls who accompanied the bride, when she married, wore long, white and pink gowns too; -** seems to be over-specified and harder to process than the original utterance.

The wedding description reported features stylistic and rhetorical patterns which allow the piece to be classed as subjective and emotive speech, i.e., **grand style**, **beautiful**, **inspiring music**, **divine singing**. Participants in the ceremony, from different cultural backgrounds or age groups, may have described the scene using different frames of presentation and reference, according to personal taste and impressions. In the conversation, no details are given about the number of people in the bridal party, style of dresses, shade of colours, type of music played, location and time of ceremony. Thus, the addressee can recreate visual and auditory images, according to her experience of weddings. She is not committed either to investigate the reliability of the report, or to extend the information. She may, in turn, recount the event with personal variation and commentary. However, this will have little influence on the evolution of wedding set-ups. Future weddings are bound to have, more or less, the same configuration and attributes if occurring between people from similar cultural background or wishing to adopt the same style of wedding ceremony.

5. Isomorphic or secondary speech genres

Scientific discourse has been investigated by philosophers and linguists for different purposes. However, it seems to have attracted little interest from pragmatists and presupposition analysts. Ever since Galileo (1564-1642) made scientific communication a public enterprise, this realm of discourse is represented by a body of information that is available to the participants in the speech event for criticism, extension and/or falsification. The interactants share the same training and consequent conceptual, pragmatic and linguistic world of the community of thought and practice. Thus, their relationship in the speech event is isomorphic, that is, they have the same role and status in the interaction. This openness has contributed to branching of scientific research and discourse into countless fields of research and applications. Science advances through the contributions of active individuals who work toward well defined goals. The discussions progress through the harmonisation of verbal and non-verbal codes and the weaving of cognitive and pragmatic strands from interdisciplinary domains.

Scientific advancements are the product of the struggle engaged by people from the different ages and cultural contexts to understand natural objects and processes occurring in the physical world and to explain their properties, relations and changes. The hard work of single researchers has contributed to the accumulation of concepts and know-how and led to deeper and deeper understanding of the properties of the physical world and living organisms and of the changes that can influence them. In turn, this insight has encouraged the development of techniques and instrumentation which have improved human communication and living conditions. The analysis of the report: *A Schematic Model of Baryons and Mesons* by M. Gell-Mann (1964), which introduced the quark theory into nuclear physics,

traces the schemata and pragmatic patterns or presuppositions which net scientific discourse and engage the members of the thought and action community in the discovery process. The discussion serves also to explore how scientific work is done and discussed in branches of disciplinary domains

In the brief article published in *Physics Letters,* the scientist tries to solve some very complex problems about the forces binding nuclear particles. In the process, he proposes a revolutionary model of the basic constituents of matter by introducing the concept of '*quark*' in the discourse of high energy physics.

Gell-Mann opens the discussion by picking up the loose ends of the on-going discussion about the possible forces binding 'baryons and mesons'. The two sub-nuclear particles had been observed experimentally, but their constituent forces remained undisclosed. The physicist sets the topic and problem in dialogic mode and invites the readers to participate to the argumentation and problem-solving process: "If we assume the strong interactions of baryons and mesons are correctly described in terms of the broken "*eightfold way*", we are tempted to look for some fundamental explanation of the situation" (Gell-Mann 1964:118). He relates to previous discussions and hypotheses about the nature of unknown binding entities and reviews the mathematical solutions to the problem proposed by himself and fellow physicists. He highlights the consistency of some of the arguments: "… a highly promising approach is the purely dynamical "bootstrap" model for all the strongly interacting particles within which one may try to derive isotopic spin and strangeness conservation and broken eightfold symmetry from self-consistency alone" (Gell-Mann 1964:118). Then, he indicates some mathematical discrepancies in the explanations of the interacting forces and states that the models proposed leave open "… important questions regarding the algebraic properties of these interactions…"(Gell-Mann 1964:118).

He discusses symmetries and other physical properties of sub-nuclear entities and then proposes his new scheme: "it is therefore tempting to try to use unitary triplets as fundamental objects" (Gell-Mann 1964:118). He then works out formulae to justify and visualise mathematically the physical and interactional properties first of the hypothesised triplet as a set and then of each constituent particle. Thereafter, he postulates: "We then refer to the members $u^{2/3}$, $d^{-1/3}$ and $s^{-1/3}$ of the triplet as 'quarks' q and the members of the anti-triplet as anti-quarks q^- " (Gell-Mann 1964:118).

Gell-Mann continues the explanation of his model of the 'quark scheme'. He considers the advantages that his proposal seems to have compared to previous attempts and speculates about the possible advancement that the novel conceptualisation of the forces binding the sub-nuclear entities may bring to the disciplinary world. Then, he underlines the fact that, for the time being, his model is based on mathematical inferences and representations of the possible physical properties of the supposed triplet. The scientist refers to some very difficult mathematical concepts and inferences as if resulting from an amusing game: "It is

fun to speculate about the way quarks would behave if they were physical particles of finite mass (instead of purely mathematical entities as they would be in the limit of infinite mass)" (Gell-Mann 1964:119, original parenthesis). He re-states the hypothetical nature of his proposal and concludes with a litotes: "A search for stable quarks …. at the highest energy accelerators would help to reassure us of the non-existence of real quarks" (Gell-Mann 1964:119). Thus he submits the challenging problem he has been probing for his colleagues to pursue.

The very title of Gell-Mann's paper lays out the topic and embeds the cognitive, pragmatic and linguistic presuppositions on which the scientist builds his report. His schematic model is a mathematical and physical definition of 'baryons and 'mesons', two subatomic entities that interact by strong force. These entities are already known to the nuclear physicist community, thus, the author does not linger to define them. The same background knowledge expectations allow him to use term-concept as 'spin', 'charge', 'mass', 'conservation', 'symmetry', 'parity', 'violation' and other related electromagnetic properties of particles and their symbols. The scientist offers no explanation for the working of the mathematical operations proposed. He trusts that the readers share the same faith in the factuality of mathematical reasoning and that they are also familiar with the working of formulae, technical terms and field related procedures. These strategies are components of the patterns of thought, activities and speech patterns shared by the disciplinary community of thinkers working on theoretical and nuclear physics.

The representation of each of the concept builds on mathematical, geometric and pragmatic structures that are acquired through academic training and maintained by constant work in the field of research. The factual existence of the sub-nuclear world inferred in the discussion is supported by evidence of the behaviour of the entities-constituting matter which physicists can verified through scattering techniques, observation of radiating materials and disintegration of atomic nuclei. These facts and observations are expected common ground knowledge of the thought community. This supposition justifies the strictly essential information given by the author. Gell-Mann follows Grice's co-operative principle and respects the maxim of quantity, quality, relation and manner in his exposition (cf. Grice 1975). The specifications of each maxim are governed by disciplinary knowledge, norms and ethics. The discussion is addressed to a community of peers who can verify the claim and who could take offence if each institutionalised term and notion were to be explained.

Gell-Mann presents his arguments in neutral language striking a balance between known and novel information and supporting the latter with elegant mathematical explanations. Thus, he creates the ground for presupposition extension. The problems he envisages and tries to solve relate directly to on-going discussions within the research area. The recipient-participants in the discussion are aware of the tentative models previously proposed by the same physicist and other colleagues working to understand and then classify strongly interacting particles into orderly arranged families (cf. March 1983). One of these proposals, termed the

eightfold way, groups mesons and baryons into multiplets of 1, 8, 10, or 27 members on the basis of various supposed physical properties. This scheme, along with the concept of 'strangeness', naming a puzzling behaviour in the interaction of subatomic particles, is touched on briefly in the report. Both tentative conceptualisations of the models had been proposed by Gell-Mann himself in 1961 (cf. March 1983).

Gell-Mann's text follows the layout of scientific argumentation described by Toulmin (1972). The major constituents of the discussion are:

Claim   **The major proposition or conclusion of the argument;**
Grounds   **The evidence upon which the claim rests i.e. facts, experimental research, data, statements from field experts;**
Warrant   Facts which justify the grounds and make them relevant to the claim;
Backing   Further evidence for accepting warrant;
Rebuttal   Counterfactual arguments, exceptions to the claim, warrant of backing or reasons for accepting them.

Specifically, the claim or hypothesis of the quark and anti-quark constituents is grounded on mathematical demonstrations and warranted by reasoning and notation of the electromagnetic model of particle interactions. The argument is backed by a mathematical definition of the quark scheme, supported by physical explanations and reference to the findings of other researchers working in particle physics (Gell-Mann 1964:118-19). The scientist defines his proposal a mathematical speculation, mentions the 'fruitfulness' of his conceptualisation, but leaves open the discussion for members of the scientific community to disprove his claim.

Gell-Mann is aware of the cognitive and pragmatic patterns shared by his audience. He also knows that his possible readers have direct mathematical and technical know-how to work out the mathematical equations he devises to explain his model. With his readers, he is also aware of the actual state of the discipline. He shares knowledge of the possibilities, instruments and other tools, available for the verification of his claim (cf. Tarantino 2004) His discussion proceeds tentatively through the presentation of 'acceptable' supporting arguments (cf. Toulmin 1972). He elicits the active participation of expert readers through structure as: 'if we assume that…', 'if we consider that…', ' we can dispense entirely of…', ' we then refer to the members…'. The inclusive 'we' approach is used even in the designation of the hypothesised particle: ' We then refer to the members ….. of the triplets as "quarks"…". Thus, the term is proposed as if issuing from a collective decision of the interactants

Gell-Mann's description is tentative with the occurrence of many modals whose value and criteria for assessing their force is field dependent (cf. Toulmin 1972). He is aware that his readers know that the supposed logico-semantic leaps required to understand and recreate the message are linked to mathematical concepts and frames of sub-atomic entities whose descriptive model is still in evolution. The discussion builds on the iteration of nouns and on the processing of mathematical

concepts so as to facilitate the visualisation of the particles defined and their interactions and to avoid reference ambiguity. The terms and expressions used in the report are technical, but if paraphrased in ordinary language, they would lose their meaning and their reference to the realm of things which are beyond sensory experience and which can be accessed only through powerful instruments or logical reasoning (cf. Monk 1994).

Gell-Mann's uses institutionalised technical terms whose meaning is shared by his audience and invites each member to participate to the discussion by interweaving 'common ground knowledge': verbal, mathematical and geometrical patterns with novel concepts as required to visualise the three particles hypothesised. The audience can evaluate the content by working out the formulae supporting the claim. Then through mathematical demonstration and experimental findings it can criticise the original claim and/or expand the discussion by intervening through other reports.

Gell-Mann's paper indicates that the author draws on a rich philosophic, scientific, literary and cultural background. He designates novel models and theories by using words from different sources. The expression 'eightfold way', which he had chosen to name his first tentative model of the strong interaction between baryons and mesons, comes from Buddha's Eightfold Path to Enlightenment and Bliss. The term 'strangeness', with which, in his discussions, he dubs a quizzing behaviour of nuclear particles, has its origin in the observation ascribed to Francis Bacon about the asymmetry of natural objects: "There is no excellent beauty that hath not some strangeness in the proportion". The term 'quark' chosen by the scientist to designate the three particles proposed in the paper was admittedly adopted from James Joyce's *Finnegans Wake* and specifically from the passage:

> *Three quarks for Muster Mark!*
> Sure he hasn't got much of a bark
> *And sure any he has it's all beside the mark.*
> (Joyce 1964:383)

The meaning of '*three quarks*' in "*A Schematic Model of Baryons and Mesons*" is well defined in the text where each *quark* is given a proper name: 'up', 'down', 'strange' and a quantitative specification with respect to charge and spin. These physical properties characterise the particle and allow other researchers to extend the knowledge of the entity and where necessary re-conceptualise it. The three 'queer particles' hypothesised by Gell-Mann and the concepts and models of the nuclear forces regulating the sub-nuclear-world he proposed have revolutionised particle physics. Researchers have discovered *quarks* experimentally and found that the family consists of six particles. To the three originally described, they have added the 'charm', 'beauty' and 'top' quark. Each quark is now distinguished by 'flavour' and 'colour' (cf. Crease 2004). These qualities have no relation with their homonyms in ordinary discourse. The relative concepts draw on discipline-specific theories, mathematical models and conventional modes of discourse articulation.

The search for quarks has fostered the development of new technology for investigating the nuclear world. The intellectual, instrumental, linguistic and pragmatic edifice of particle physics is thus in constant evolution with consequent spin-offs on the cognitive and pragmatic presupposition cementing the discursive network and the communities of users.

6. Discourse in narrative

James Joyce is considered a writer of great narrative power and his work is under the constant analysis of scholars and students of the arts. His innovative novel *Finnegans Wake* has been extensively discussed and commented. However, in literary circles there seems to be no unitary agreement about the general meaning of the work and the possible connotation of the expression 'three quarks' in the piece which has linked the novel with nuclear physics. Joyce uses "… the Nichtian glossery which purveys aprioric roots for aposteriorious tongues …" (Joyce 1964:83), to state that his novel is open to subjective interpretation: "So you need hardly spell me how every word will be bound over to carry three score and ten toptypsical reading throughout the book …" (Joyce 1964:20). He is aware that the meaning of each word, expression and full text depends on the readers' presuppositions. In the wake of Aristotle and other philosophers and pragmatists, he reminds his readers of the varieties of genres stratified in the language of a people. He underlines the fact that meaning depends on the trades, arts and purposes of the different communities of speakers which contribute to social welfare. Joyce emphasises the distinctiveness of each community of practices early in his novel: "… every crowd has its several tone and every trade has its clever mechanics and each harmonical has a point of its own, …" (Joyce 1964:12). Later on, he hints at the difficulties met in the "dozen and odd" years spent in writing the "foluminous" tale and the effort expected from the reader "…its bitter to compote my knowledge's fructos of. Tomes" (Joyce 1964:155).

In the *Wake*, Joyce portrays the history of the world by infinite regression and recollection of the various successive stages in the journey of humankind from primitive to modern life. He organises his tale according to Vico's '*ricorsi*': cyclical evolution of history and society, "…timing the cycles of events grand and national, bring fassilwise to pass how" (Joyce 1964:12). The narration has no chronological order, it relies on reiteration of names, images, events, concepts and expressions. The prose writing is intermingled with musical scores, verses and songs. It features mathematical, geometric and algebraic notations, but these are not used in primary problem solving functions as they would be employed in a scientific text. Joyce conflates space and time following Einstein's relativity theories. He relates to the philosophy of ancient and modern scholars from every culture of the world with particular attention to Saint Augustine, Nicholas of Cusa, Giordano Bruno and Henry Bergson. He uses expressions from the works of these thinkers to emphasise the multiplicity of human nature and to highlight a kind of unified consciousness that links mankind to the physical world.

The main character of the novel is Humprey Chimpden Earwiker, owner of a pub in Dublin. Throughout the text he is referred to by " … the sigla H.C.E. … which gave him as senses of those normative letters the nickname Here Comes Everybody" (Joyce 1964:32). H.C.E. is thus a creation of the author and serves as a portmanteau figure on which he stacks his "pile of samples". Through this 'persona' Joyce intends to represent all humanity from Adam to the electron generation: "… the sameold gamebold adonic structure of our Finnius the old One, as highly charged with electrons … may be there for you, …" (Joyce 1964:32). H.C.E. is both a builder of cities, a creator of theories and a dreamer of dreams. Through the novel, he assumes different guises and personifies the individuals from different ages and cultures who have contributed to the advancement of thought, knowledge and living conditions. Recurrent themes in the work are concepts debated in the course of human history as the one of relativity, the idea of infinity, represented through the circle, and the notion of complementarity.

Joyce traces the origin of all these concepts in Greek philosophy. He links the ancient philosophers' ideas with Nicholas of Cusa's concept of relativity and discussion on the coincidence of contraries " I in my hereinafter of course by recourse demission me—by the coincidance of their contraries reamalgamerge in that identity of undiscernibles where the Baxter and the Fleshmans may they cease to bedivil uns…" (Joyce 1964:49-50). Joyce focuses on the complementarity existing between man and woman, Christians and Jews, science and religion, music and poetry, literature and philosophy, good and evil. He argues for a harmonious interrelation between generations, peoples, social stratas, cultures and religions. "So content me now. … Unbuild and be buildn our bankaloan cottage there and we'll cohabit respectable" (Joyce 1964:624).

According to Joyce, every member of humanity carries the imprint of past generations and is a microcosm with qualities and shortcomings of humankind: "… likeas equal to anequal in this sound seemetery which is leebez luv" (Joyce 1964:17). In the novel, love is the source of life, hope and social communion. Thus, the plea for tolerance achieves universal dimension.

Joyce's treatment of language in the novel is believed to have been influenced by the report of the disintegration of atoms with the creation of new particles by Lord Rutherford in 1919 (cf. Duszenko 1994). Joyce reports the event as a news broadcast: "The abnihilisation of the etym by the grisning of the grosning…of the first lord of Hurtreford expolodonates through Parsuralia …" (Joyce 1964:353). However, his representation is far from the actual description made by the physicist who, in neutral language, reports having observed a number of scintillations which induce him to hypothesise the formation of a different element from the original nitrogen atoms he was investigating (cf. Rutherford 1919). The literary report projects the event from the atomic to the human scale and renders it similar to a mega-bomb explosion. In the *Wake,* Joyce recalls that the technique of decomposing and composing chemical elements has its roots in ancient alchemy

and in scientific experiment dating back to R. Boyle and H. Davis. These sources and relative techniques and work are mentioned recurrently in the text.

Joyce's technique of disassembling and reassembling words and expressions may have been triggered by his scientific readings. But it has its root in the mechanics of morphology and syntax. The following statement seems to reflect this origin of the 'nichtian' prose "… dialytically separated elements of precedent decomposition for the verypetpurpose of subsequent recombination… by the ancient legacy of the past, type by tope, letter from litter word at ward,…" (Joyce 1964:614).

Finnegans Wake can be read as a mock-heroic piece, but the arguments proposed have historical, social, scientific and philosophic underpinnings. Therefore, understanding the novel requires cognitive and pragmatic presuppositions of different disciplinary realms. The relation between the author and reader is non-isomorphic. The facts mentioned or adumbrated in the texts can be perceived by evocation and 'recollection in tranquillity' of past readings and experience, but they cannot be falsified by direct investigation of facts through experimental means. As any other mimetic work of art, Joyce's novel can be imitated or paraphrased, but its content cannot be expanded. The *Wakian* world is thus crystallised in time and space.

The piece featuring the *three quark* expression, is a 13 line poem heard at H.C.E.'s pub. It relates to the popular old legend: *Tristan and Iseult.* The tale of the two sad lovers is introduced at the very beginning of the *Wake*: "Sir Tristram, violer d'amores …" (Joyce 1964:3) and then referred from time to time through the text. The recreation of the ancient fable draws on popular, musical and literary sources. But the dramatisation in the novel is interspersed with the author's personal experience, imagination and keen sensitivity to words. In Joyce's work, the term *quark* is charged with allusive reference, as are most of the words and expressions wrought in the specific passage. The reader can appreciate the meaning of the piece according to his/her evocative abilities, familiarity with the legendary dramatic persona (King Mark) jested in the verses as well as with the rituals and raillery of drinking parties. The artistic value of the literary piece can be appreciated through commentaries, but no addition or expansion to the original text can be made. Joyce's *three quarks* will remain fixed in time and space.

7. Discussion

The foregoing discussion indicates that presuppositions drive the production and understanding of the texts from the different speech domains. The presuppositions intertwined in ordinary speech draw on personal experience and concepts originating in social institutions and everyday interactions contributing to primary culture. They have linguistic, cognitive, and pragmatic levels of reference. The category combines social, expressive and descriptive language functions (cf. Lyons 1993). The statements of everyday speech are not put forward for verification as are the assertions of scientific communication. Thus, the spoken or written texts of this genre require no precise specification of physical and other attributes of the

90

entities and events discussed. The discussions may be coloured by personal, affective and emotive features with consequent use of evocative lexical items and metaphors. Nonetheless, the speech event tends to display more concrete extratextual referents than literary prose.

Needless to say, ordinary speech, in all its forms, is very important in human communion. It contributes to the growth of every individual by governing affective and instructive interactions. It is the primary simple agent of relationship between the physical, social and mental worlds of each individual. It serves to establish and maintain social relations. In every culture of the world, ordinary speech has been a seminal source for mimetic genres with conversation being used for dramatic effects in poetry and prose (cf. Daiches 1969).

The presuppositions of scientific discourse draws on intellectual, practical and linguistic skills developed through the academic training, experience and activities of secondary culture. The genre combines social, descriptive, hypothetical-deductive and probative language functions. It is topological in nature since it focuses on substance, quantity, distribution, cause and effects, time and space variables and other physical aspects of entities and processes. It interweaves mathematical and geometrical concepts, thus, it draws on Aristotle's and Galileo's teachings. In scientific spheres of communication, even metaphors and emotive items have specific epistemic, mathematical and disciplinary content.

The number 'three' and the sound of the word 'quark' in Joyce's work seem to have triggered the Gell-Mann's decision to name his hypothesised triplet 'quarks'. However, apart from the graphic and phonetic aspects, there is no relation whatsoever between the allusive reference associable with the words in Joyce's piece and the geometric and physical concepts stratified in the homonym used by Gell-Mann. In the scientific report, the definition of the term more than on metalinguistic elements is based on mathematical and physical notations which open the concept to verification. The background assumptions and the purposes of the scientific and literary authors and texts differ. The difference in the conceptual content of the linguist items in the two discourse universes goes well beyond the single verbal item, sentence or paragraph. J-F. Lyotard (1986) explains the sources of the non-equivalence of the cognitive, pragmatic and linguistic structures occurring in the different knowledge spheres very succinctly: "It is impossible to judge the existence of validity of narrative knowledge on the basis of scientific knowledge and vice versa: the relative criteria are different" (Lyotard 1986:26)

The presuppositions netting discourse of narrative genres draw on personal creativity and experience nurtured in socio-historic and literary training. The genre combines poetic, emotive, metalingual and referential functions. Its main purpose is didactic, ludic and moral. The personae and the circumstances used to deliver the message can be totally imaginary as well exemplified by H.C.E. and the dream frame used in *Finnegans Wake*. Joyce's work displays all these variable. The episodes it builds on have real referents in history, philosophy, religion and science.

But the presentation is imbued with subjective and personal references. The history of humanity which is dramatised in the tale is reflected through the author's mind's eye. However Joyce's background knowledge rests on geographic, philosophic, historic, poetic and linguistic frames of reference. Thus, appreciation of the narration requires the readers to activate frames of reference similar to those evoked in the text.

In discussing text production, Bakhtin provides other illuminating comments on the differences between speech types. He classes them into two macroscopic categories which he terms 'homeothetic' and 'ideographic' forms of knowledge and communication. He associates the former with relational, poetic and emotive speech, the latter with ideational, referential and probative discourse. Bakhtin explains that the two epistemic and expressive universes are different but complementary. This characteristic is emphasised by Lyotard who considers scientific and literary knowledge and genres the fruit of human nature, needs and interests, thus, necessary for the well being of humanity. The French philosopher linguist explains that the relative discourse domains are composed of sets of statements or 'moves' made by players who follow a distinct framework of applicable rules. Recalling Aristotle's teachings, he states: "These rules are specific to each particular kind of knowledge; and the moves judged to be 'good' in one cannot be of the same type as those judged 'good' in another…" (Lyotard 1989:26, original indentation). This observation should advise caution in the application of pure linguistic theories and techniques in the investigation of disciplinary discourse. A combination of perspectives and a better insight into the 'rules' shared by the interactants and into the relationship between conceptual, pragmatic and linguistic structures of a text could provide possibilities for the development of more effective descriptive models of discourse.

8. Conclusions

The foregoing discussion on the cognitive and pragmatic presuppositions which establish communication networks between interactants and differentiate discourse domains has indicated the relevance of this category in the meaning making process. From the texts discussed, it appears that the category contributes to rendering discourse interactive, dynamic, coherent and appropriate. In every discourse sphere, extra-textual strands shared by the interactants appear to be active elements of the meaning making process. The three pieces analysed present properties of the relative genre type, but they also feature the 'imprint' of the authors of the pieces and of the audience they are intended for.

Presupposition are important components of the compositional meaning underlying the coding and decoding process. They are also markers of the evolution potential of each discourse sphere. In ordinary speech and literary narrative, they draw on fluid cognitive and pragmatic strands. The arguments tend to focus on past events framed within subjective boundaries. The texts of these spheres of discourse seem not to be bound to a rigid observance of Grice's co-operative principle. This makes the relation between source and audience non-isomorphic and influences

possibilities for meaning expansion. The presupposition of scientific genres are based on tighter grids of schemata and pragmatic patterns shared by the disciplinary community. Grice's co-operative principle and maxims are more relevant to specialist argumentation. The researcher/reporter can leave his/her imprint on the observation and discussion, but the claim is open to verification and falsification by members of the thought and research community. The relation between source and audience is isomorphic since the whole activity is projected toward peer assessment and future expansion. Thus, both the research world, and the pragmatic and cognitive patterns of each area of research are open to continuous revision and evolution.

Although tentative, the present study invites a reflection on the need for more articulated analysis and description of speech samples from the different realms of culture and knowledge. The descriptions should be in awareness of the personal and cultural imprint of the individual author. They should include considerations of both the rules and content of disciplinary communication as well as of other texts of the particular discourse sphere connected with the piece investigated.

In view of the role that presuppositions can have in establishing communication in primary and secondary spheres of discourse, it seems appropriate to suggest that this category should be part of linguistic and communication research. In LSP studies, the investigation could prove fruitful in bringing a deeper comprehension of the nature and influence of presupposition on discourse articulation and interpretation. At the same time, it could provide possibilities to improve understanding of the relationship between conceptual, pragmatic and linguistic patterns. This awareness could favour an interdisciplinary approach to language study and prove beneficial for theoretical and applied research.

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ABSTRACT

Pragmatic and Cognitive Presuppositions
Across Discourse Spheres

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Keywords:
Presupposition, utterance,
discourse, genre, epistemic patterns

The purpose of this study is to show the relevance of presuppositions in the coding and decoding of meaning and communication. The category is framed in terms of "…a background of beliefs or assumptions which are shared by the speaker and his audience and which are recognised by them to be so shared" (Stalnaker 1999:48). The working hypothesis is that in order that communication be achieved, the participants must share a linguistic system along with epistemic, practical, socio-cultural and linguistic patterns.

The paper first traces the historic roots of the concept of presupposition in the work of scholars from classic to contemporary time. Next, it briefly overviews current descriptive models of the epistemic category. Through a Bakhtinian perspective of genre, it then identifies the presuppositions which govern the composition of meaning in texts from three speech domains, namely, an ordinary conversation, a scientific report and a modern novel. The final discussion touches on the epistemic, pragmatic and linguistic properties embedded in the presuppositions characterising each discourse sphere.

The analysis confirms that this epistemic category determines domain restriction of meaning and characterises distinctive genre types. The significant role of presuppositions in communication supports the conclusion that they should be accounted for in applied linguistic studies. The holistic investigation of genre types could throw light on the relationship between the conceptual, pragmatic and linguistic strands interlacing discourse and enable a deeper understanding of the interaction between linguistic and extra-linguistic patterns in speech events. In turn, this awareness could favour an interdisciplinary approach to communication studies and prove beneficial for theoretical and applied research.

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