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Specialist Thinking Strategies in LSP Communication of the Natural and Technical Sciences

1. Introduction

Since the mid-1980s, as is generally known, the cognitive expansion of LSP research has led to a shift in its focus of analysis (Baumann: Kalverkämper/Baumann 1996: 355). Since then, the focus of LSP research has been the communicative implementation of the mental structures and processes that form the basis of the production and reception of LSP texts.

Representative LSP text analyses from various scientific disciplines, technical chains of action, and individual languages have presented proof that, by examining particularly the dialectic relationship between LSP and LSP-based thought patterns, one would meet the methodological prerequisites to determine the efficiency of language as an instrument of thought in a more differentiated way (Baumann 1992: 139; Haken/Haken-Krell 1997; Zimmer 1999). There is a tremendous potential for possible findings underlying this multi-faceted scope of investigation, which affects the different aspects of linguistic externalisation and internalisation of scientific findings and the inherent strategies to transfer mental representations of LSP-based reality by means of communication (Baumann 2001). From a methodological point of view, this gives rise to the task of analysing the specific influence exerted by a respective object or subject field on LSP (-based thought patterns)(Leont’ev 1987: 98).

In the mid-1980s, G.W. Kolschanski had emphasised, in studies on the linguistic expression of the elements of thought, that

... in the end, any given text is structured through the object and the thought and speech operations that reflect the denotatum of the linguistic fragment... Any text is equipped with these characteristics, so that structure, delimitation, and cohesion of any text represent integral communication; otherwise the communication partners would not be able to come to an understanding (in a broad sense) (Kolschanski 1985: 80).

Simultaneously, R. Buhlmann and A. Fearns (1987/2000) have reached wide-ranging conclusions from the point of view of foreign language method-oriented analyses that were aimed at the conveyance of natural science/technical LSP. These findings concerned the complex relationship between the respective technical object at hand – LSP-based thought patterns and LSP.

The two researchers expressed these conclusions as follows:

Therefore, LSP as a means of communication is a result of socialisation within a certain scientific discipline. It is characterised as such by reflecting certain thought structures that are determined by the interest in findings and research prevailing in the respective field. LSP is important for the communication of technical contents – objects, operations, processes, procedures, theories, etc. – and, from a linguistic point of view, uses the most concise and precise form... (Buhlmann/Fears 2000: 12-13).

They ultimately draw the fundamental conclusion that: “… LSP is therefore linked to the thought elements of the field that the technical terms exist in – the thought structures of the field and the customary communication structures of the discipline” (Buhlmann/Fears 2000: 13).

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There are an increasing number of illustrations relating to the history of science and the philosophy of science pointing out the methodological significance of the interactive relationship between the technical object at hand and LSP-based thought patterns characteristic of a certain scientific discipline. The complex relationship existing between LSP-based thought patterns, the scientific object and LSP, however, are still frequently avoided (Grmek 1996; Breuer 2001; Pauen/Roth 2001; Kromrey 2002). In this respect, one of the topical challenges of LSP research and other (non)linguistic disciplines lies in the extraction of the diverse communicative-cognitive strategies of an efficient specialised knowledge transfer.

The category of LSP-based thought patterns has, since the mid-1980s, assumed a central epistemological role in interdisciplinary LSP text analyses (Baumann 1992: 144). It is aimed at systematically analysing the particularities of the knowledge process in a specific technical-professional environment of reality.

LSP-based thought patterns are therefore perceived as exceedingly complex cognitive operations that are based on analysing and/or regulating the processing of information.

In the scientific process of investigation, the dominant role befits LSP-based thought patterns, since terminologically predetermined cognitive reflections of technical spheres of objective reality are conveyed through analytic-synthetic thought operations as a result of them. Depending on the status of the investigations, the cognitive reflection of technical contents and processes is of partial nature which may be complemented through secondary knowledge processes (Müsseler/Prinz 2002: 645).

In this context, the acts of drawing empirical and theoretic conclusions form a dialectic relationship in the LSP-based thought process. By uncovering the driving force, the causes, and the regularities of certain developments of technical reality, it becomes possible to formulate specific scientific theories that help reflect the object of investigation more thoroughly than through mere observation. In doing so, LSP-based thought patterns are viable through the use of the preferred of certain thought methods and thought procedures (Bochenski 1993).

From the perspective of the appropriate analyses, the LSP-based thought process is mainly determined by the following factors:

- the mental structuring of the scientifically specialised subject field,
- the nature of the mental objects (homogeneity or heterogeneity of objects that are subject to cognitive processing),
- the quality of the subject or object-specific status of investigation,
- the subjective stance on the object of investigation,
- the allocation of tasks and the inherent cognitive requirements,
- the proximity of the object of investigation to the researcher’s quotidien scope of experience,
- the practice-orientedness of the knowledge process (fundamental vs. applied sciences),
- notions and schemata as cognitive models of organisation,
- the application of scientific principles of investigation (inductive or deductive reasoning),
- the historic, ideological-philosophical, cultural, social and economic foundations of the knowledge process,
- the mental quality of perception of specialised contents (affirmative/critical/rational/emotional orientation),
- the identification of the individual’s specific thought patterns (schools of thought),
- the mentally anticipated goal of investigation (quest for rules, practical implementations),
- the researcher’s/researchers’ motivation determining the knowledge process,
- mental strategies/methods of analysis,
- the ethical neutrality of scientific investigations and
Representative studies carried out in various academic disciplines and individual languages have shown that the specific strategies of LSP-based thought patterns constitute the methodological starting point for the analysis of the linguistic transfer of terminologically predetermined reflections of specialised contents. This epistemologically innovative analytical approach enables current LSP research to implement the cognitive shift in an object-specific way. This shift is aimed at developing typologies of LSP-based thought strategies conductive to the deduction of a typology of communicative regularities that occur when implementing reflections of subject-specific reality.

One first step of communicative-cognitive examinations of LSP-based communication thus consists in depicting the diversity of individual scientific disciplines in terms of cognitive operations, strategies and processual qualities of mental activity, that determine the way in which a specialists orient themselves in their specialised environment and how they intellectually master them (Prim/Tilmann 1997).

The next step will then necessitate a delineation of the multi-faceted communicative constitution of technical thought patterns. This leads to a detachment of the relationship between the mental representations from the specific specialised situation of activity, its generalisation, and transfer of cognitive performance onto new technical requirements.

The third focus consists in forming an analytical connection between the mental representations of the different classes of contents which are customary in the respective field, as well as the mental performance characteristic of certain specialised situations of activity and their structural-functional implementation in the context of LSP-based communication.

The results of investigation stemming from LSP-linguistic research carried out in the last few decades confirm that a scientifically reflected differentiation of objective reality goes hand in hand with a multi-faceted differentiation of LSP communication, designed to facilitate the best possible transfer of information. The increasing number of LSPs differs from one another in structural-functional and/or communicative/cognitive characteristics on varying levels (Hoffmann 1976; Baumann 1994). In this context, statistical analyses of language have shown that the number of identical characteristics between the respective LSPs may vary (Hoffmann/Piotrowski 1979).

In addition to its differences, a further focus of analysis has consequently become the criterion of homogeneity of LSPs (Hoffmann 1984: 53; Fluck 1997). This is the analytic focus of mainly those LSP-linguistic approaches that endeavour to present proof of a structural-functional kinship between LSPs in scientific fields with LSPs in other academic disciplines linked to them (nature, society, thought and others) (Hoffmann 1978; Satzger 1999).

Three different scientific complexes have emerged regarding the level of homogeneity or heterogeneity of individual specialised academic disciplines and their LSPs:

- LSPs and the natural sciences (cf. exact and biological natural sciences) Pörksen 1986; van Doren 1996),
- LSPs and the humanities (philosophy, cultural and social sciences, political science, economics and law, linguistics, art research, pedagogics, ethnology, anthropology and others) (Skudlik 1990),
- LSPs and the technical sciences (process engineering, biomedical engineering, mechanical engineering, nuclear engineering, biotechnology, environmental technology, traffic technology, mining and others) (Krings 1996; Fischer, 2004).

Some illustrations under the ‘philosophy of science’ label are increasingly eager to extract the cognitive foundations of LSP-based thought patterns in the natural, social, and technical sciences (Gloy 1995, 1996; Lyre, 2002). A first focus of these studies consists in implementing the purpose of the sciences and in documenting the respective epistemological basic values, basic norms and
perspectives. A second focus aims at investigating the question of how the specialised basic concepts and methods customary in one scientific field have to be arranged in order to optimise the acquisition of knowledge.

In this context, the central elements of LSP-based thought patterns in the natural sciences can be characterised as follows:

1. The acquisition of knowledge focuses on a complex of animated, as well as lifeless, characteristics of nature (including man’s nature-relatedness).

2. Depending on the current level of knowledge in society, a theoretically founded and empirically secured differentiation of natural scientific reality shall be assumed.

3. In the specialised “spheres”, the acquisition and classification of factual knowledge is in the centre of attention, i.e. deriving physical constants, understanding basic characteristics of matter, deducing equations, algorithms, and models, deductive theories, and the extraction of objective laws of nature. From an epistemological point of view, the principle of causality plays a decisive role here.

4. The systematic investigation of the branches of biology requires an object-oriented system of technical terms, categories, constructs, principles, and methods (Thielmann 1999).

5. The acquisition of knowledge from the knowledge subject to the knowledge object is put into practice with the help of certain analytical means (appliances, substances, experiments etc.) (Lenk 1998).

6. Without establishing measurement parameters and/or and exact metering of measurable entities of specialised matter, the acquisition of knowledge on a high level of formality, objectivity, and precision, is impossible (e.g. pattern recognition, development of paradigms and regularities) (Lyre 2002: 214).

In contrast to this, LSP-based thought in the field of humanities is characterised by the following factors:

1. The quest for knowledge concentrates on the extraordinarily complex interactive relationship between man and society. Finding evidence for certain regularities of social development is the main interest of investigation.

2. Man and society as objects of investigation are subject to an object-oriented classification into individual scientific disciplines, which deals with the various aspects of this dialectic element of analysis in a target-oriented way. In this context, the unity of theory and practice, and the primacy of thought and existence, play a fundamental epistemological role.

3. Basic elements of the knowledge process are the deduction of a goal of investigation, a theory (an intellectual approach or school of thought), the creation of a terminological system, the finding of empirical facts, and the theoretical assessment of specific results (Kromrey 2002: 53). The appropriate thought cycles can be followed back to the cognitive theory-experiment-theory pattern.

4. The self-orientedness of man’s intellectual discussion, concentrating on himself as the object of investigation, leads to the utilisation of methods of investigation that interpret, compare, classify, assess, and are open to subjective explanations (Bochenski 1993: 12).

5. The epistemological quality of thought patterns characteristic of the social sciences is mainly dependent on the researcher’s point of view, since the knowledge perspective of the individual is influenced by a complex of individual, social, economic, cultural, ideological, and other factors.

6. Emotions as a cognitive assessment of social scientific subject matters are a constituent of specialised thought strategy (Otto/Euler/Mandl 2000).
Specialised thought patterns in the only recently-evolved technical sciences mainly feature the following characteristics:

1. The acquisition of knowledge focuses on illustrating, designing, and optimising technical procedures, as well as on modelling and using technical systems. Prerequisites are: knowledge of the laws of nature, acquaintance with materials and their characteristics, knowledge of handling methods, the ability to think ahead in a productive manner, and implementing ideas purposefully in order to improve man’s practical living conditions.

2. The traditional distinction between different branches of technical sciences occurs on the basis of the practically or industrially connected branches of work processes (mining and metallurgy, electrical engineering, production engineering, construction technology, heating engineering etc.).

3. The depiction and utilisation of natural events and the laws of nature in technical and technological systems represents the epistemological framework for the specialised thought patterns characteristic of the technical sciences. It is aimed at the derivation of technical laws, which are in turn based on the dialectic relationship between the system in its entirety and the element, or rather between necessity and coincidence. Correspondingly, technical laws could be subdivided into anticipating (normative-descriptive, prescriptive-descriptive), universal and representational ones.

4. Thought strategies typical of the technical sciences are coined by the specific handling methods used by the researcher with regard to an object of investigation, whereas these are closely linked to the characteristics and functions of the respective instruments (appliances, machines, procedures etc.).

5. The cognitive transformation procedures that are to be presented, and that result from applying the laws of nature to their practical spheres of validity, are the central element of thought patterns characteristic of the technical sciences.

6. Thought patterns typical of the technical sciences are genuinely interdisciplinary and aim at the activation of man’s unlimited development potentials as an unconscious element of the man-machine-system (Fischer 2004: 180).

The analysis of LSP-based thought patterns characteristic of each of the three scientific disciplines shows that specialised thought strategies contain changing as well as unchanging elements. As a consequence of the interdisciplinary interplay of natural, social and technical sciences, however, the respective specialised thought strategies may overlap.

2. The contribution of rhetorical-stylistic means to LSP-based thought patterns in the natural and technical sciences

On the basis of LSP text analyses it has been established that the following levels (in descendant order) bearing on the use of rhetorical-stylistic means are important for developing strategies of specialised thought patterns in the communication spheres of the natural, technical, and social sciences:

2.1. The culturally specific level

The importance of culturally specific knowledge for the specialised communication process has been underestimated for a long time. In interlingual comparative analyses of rhetorical-stylistic elements in LSP texts from the three scientific disciplines mentioned above, it has been shown that especially between LSP texts from humanities and those from the natural and technical sci-
ences significant cultural differences exist. Some of these differences suggest to be statistically analysed.

In this context, we should mention the existence of different, historically coined communication styles. Among those are for instance, in the field of LSP-based communication, the Teutonic, Gallic, Anglo-Saxon and Nipponic Style (Clyne 1987: 211-247). These four communicative styles, that were born of scientific LSP text analyses carried out in the field of linguistics and sociology by the Australian linguist M. Clyne, are linked to a certain content-related and formal degree of abstraction in LSP-based communication. In this context Clyne stresses that the Teutonic and the Gallic Style in LSP-based communication require the highest degree of linguistic articulateness. In contrast to this, the Anglo-Saxon and the Nipponic scientific style are considered to be less elitist. Moreover, Clyne has convincingly drawn attention to the fact that, in the fields of linguistics and sociology, German LSP-based communication utilises different textual organisation structures than the ones customary in the English language.

While German LSP-based communication is distinguished by the element of reader responsibility (the reader’s duty to understand the LSP text without any communicative aids provided by the author), English LSP-based communication features writer responsibility. This implies that the author assumes strategic responsibility for the comprehensibility of his text. He may, for instance, facilitate its comprehension by means of a higher degree of rhetorical-stylistic means in the technical text. According to Clyne, the respective strategic differences in communication can be attributed to varying cultural traditions customary in the respective scientific communities. In this context, he states that “each cultural group has their own expectations of communication, which in turn are rooted in a specific cultural value system” (Clyne 1993: 3).

H. Oldenburg draws our attention to the high research-strategic significance of the culturally specific level in natural and technical science texts.

He goes on to explain that, “in interlingual comparisons between LSP texts from the natural sciences, which are only marginally influenced by the primary cultural systems of the linguistic communities and dominated by extra-linguistic and extra-cultural objects and subject matters, hardly any intercultural differences are to be found, whereas the differences between LSP texts from social sciences, that are closer to the primary cultural systems of the linguistic community and whose objects and subject matters are also closely linked to these, are significantly bigger” (Oldenburg 1992: 35-36).

As a result of interdisciplinary investigations of social, natural, and technical texts, it was confirmed that the culturally specific dimension of the use of rhetorical-stylistic elements is particularly significant in social science texts. In natural and technical science texts, however, the culturally specific dimension is of secondary importance, given the more strongly regulated and conventionalised LSP text structure (Lauren/Nordman 1996).

2.2. The social level

Analysing the influence of social factors on the choice and use of rhetorical-stylistic means in natural and technical science texts, the following findings have to be considered:

a. Bringing a specialised technical fact or subject matter closer to an interested layman requires great care and attention on the part of the LSP text author in the process of the linguistic composition of explanations and comments. This implies that a greater effort is needed to convey the message of the text to a layman than, for instance, to a work colleague. Varying degrees of previous knowledge on the parts of LSP text author and recipient(s) respectively lead to the integration of socially relevant elements of partner-related redundancy in order to secure the success of the information transfer.

In technical texts directed at laymen, the LSP text author is forced to adapt him/herself to the level of knowledge and expertise of his recipients by adding explanations and illustrations to foster the comprehensibility of the text. Addressing other specialists, however, these pieces of ad
ditional information are dispensable. In these partner-oriented constellations, the stylistic means
parentheses, parallelism, addenda, and others may be used to foster textual comprehensibility.

b. The analysis of rhetorical-stylistic elements indicates that a partner-related attitude on the part
of the author of the LSP text can be put into practice by means of efficiently stylised wording and
a loosened sentence structure. By using syntactic stylistic means like the chiasmus, for instance,
the author is able to get the recipient’s full attention, emphasise important findings, and/or design
the conclusion in an original and memorable manner.

c. The expressivity conveyed through stylistic means represents an important prerequisite for a
successful course of LSP-based communication, since it leads to a heightened degree of perception
on the part of the LSP text recipient regarding the subject matter at hand. Activating their atten-
tion triggers the release of cognitive energy, which favours the subjective processing of informati-
on. In this context, the degree of expressivity of grapho-stylistic means (visual code) is an element
which facilitates the decryption of natural and technical science texts (Riesel/Schendels 1975).

d. LSP text analyses from all three scientific disciplines have con-
firmed that certain semantic and
syntactic stylistic means are particularly suitable to bridge the varying levels of previous know-
ledge on the part of the communication partners in the case of a socially asymmetrical relation-
ship between them. As a consequence, the LSP text author may vary the linguistic structuring of
specialised facts or subject matters by means of repetitions and/or synonymy, and thereby helping
the recipient to remember a larger share of the pieces of information presented to him.

Choosing and using the appropriate rhetorical-stylistic means in natural and technical science
texts is therefore highly dependent on the communicative partner’s social constellation.

2.3. The cognitive level
The cognitive level of choosing and using rhetorical-stylistic elements in LSP texts gives rise to
the belief that certain stylistic means are particularly suitable to optimise proceedings linked to
information processing and information storage (Möller 1983).

In this context, Fleck has introduced the term “thought styles“, which he defines as “directed
perception and appropriate mental and factual assimilation of what has been perceived” (Fleck
1994). From a cognitive-linguistic point of view, thought-stylistic means (amplification, syllo-
gism, isologue, antithesis, simile, allegory, irony, hysteron-proteron etc.) constitute theoretical-
linguistic elements of information processing strategies, the application of which can be attributed
to certain attitudes, previous knowledge, emotional states, assessment standards, and/or emotions
on the part of the author (Nischik 1991: 58).

In natural and technical science LSP-based communication, thought-stylistic means contribute
to the implementation of the following functions:

a) Increasing the vigour when designing an LSP text (metaphor, metonymy, epithets etc.),

b) Increasing clarity in the illustration of the specialised content (e.g. anaphora and parallel-
ism as a clearly perceptible theoretical organisation pattern, antithesis, question-answer
combination, rhetorical question),

c) Striving for clarity (by means of explanatory parenthesis [explication, appendix and/or
isolation]) and for precision (images, charts, formulas etc.) as an indication of associative
thought patterns on the part of the author, and

d) efforts to facilitate the text reception (improving comprehensibility).

In LSP texts the combination of general, particular, and/or single pieces of information helps to
memorise the information and foster new findings. A generalisation of findings without reference
to particular or single pieces of information bears the risk of misinterpretation on the part of the
recipient. By inserting examples, the recipient is granted a break to think about the information that has been previously mentioned. In order to make the text reception of a complicated complex of thoughts more palatable to the reader, the author moreover can repeat facts of the case.

Thereby, one thought from the progression of information is emphasised in the LSP text. This emphasis can be achieved by means of (syndetic, asyndetic, polysyndetic) repetition or synonymy.

LSP text research in the fields of the natural and technical sciences confirms that the thought-stylistic means have a knowledge-fostering function. The choice and utilisation of the appropriate means occur on the basis of certain sender-recipient-strategies that facilitate the conveyance of specialised text contents. In this context, it has been observed that due to differing levels of previous knowledge, the diversity and the number of thought stylistic means increases, if the degree of specificity between the communication partners is rather low (Baumann 1994: 122).

2.4. The content-related fact-based level

Comparative analyses of different LSP texts from varying scientific disciplines, individual languages and LSP text types particularly indicate three determining factors, which illustrate the significance of the content-related fact-based level’s task to choose and use rhetoric-stylistic means in LSP-based communication.

a. The influence of the individual scientific discipline:
Rhetoric-scientific similarities between different LSP text forms of a single discipline (e.g. historiography, linguistics, psychology) are obviously more significant than the number of matching elements existing in texts belonging to the same LSP text form from different scientific disciplines (Baumann 1992: 74).

Skudik also draws our attention to the connection between the scientific discipline and style: Undifferentiated prior understanding detects clear differences between the language customary in the natural sciences and that of humanities. The latter seems closer to everyday speech and it is characterised, it seems, by terminologically more strongly determined use of standard language and especially through stylistic usages distinct from the scientific language. The first, however, evokes the idea of an extensive terminological apparatus, offering expressions entirely unknown to a layman, a host of formulas, and/or the formula-like employment of certain linguistic means” (Skudlik 1990: 221).

b. The relationship between the LSP-communicators and the subject matter at hand:
Rhetorical-stylistic means (e.g. captions in technical texts in the field of architecture, automotive engineering etc.) activate important impulses in the text that may foster knowledge (rationality, emotionality), facilitating the partner’s analysis of the subject of communication. Thus, rhetorical-stylistic means can contribute to lending the objective information contained in the text specific meaning. In social science texts, the stylistic means characterise the communicator’s attitude to the reflected object.

In natural and technical science texts, the choice and use of rhetorical-stylistic means are determined by the degree of detail (redundancy vs. restrictions) and precision (e.g. understatement vs. overstatement) with which the author endeavours to linguistically implement the subject matter (Jahr 2000).

c. The correlation between the system of the LSP text with regard to content and object of investigation, and the individual levels of knowledge and expertise of those participating in the act of LSP-based communication (Skyum-Nielsen/Schröder 1994):
In this context, classification of the specialised styles customary in the natural, technical, and social sciences has been attempted. For example:
1. the theoretical scientific technical style,
2. the popular scientific style,
3. the didactic style, and
4. the instructing style (Riesel/Schendels 1975; Sandig 1986).

To summarise it can be said that certain specialised contents in specific LSP text/text forms are preferably conveyed using a set of selected stylistic elements. These interactions facilitate a more efficient communicative implementation of the information transfer.

2.5. The functional level
The functional level of rhetorical-stylistic elements in LSP-based communication relates to their mode of application in the LSP text. Together with the stylistic inventory, typical aspects of the facts and processes addressed in the text are thus emphasised.

In the field of lexis, this level of rhetorical-stylistic elements is expressed by way of the area of activity of the lexical stylistic means used (foreign words, phraseologisms etc.) and/or by means of their communicative connotation (technical and dialectical terms, specialised vocabulary etc.).

However, these elements are predominantly used in social science texts. In contrast to this, natural and technical science papers are dominated by nomenclatures, abbreviations and formula expressions.

On the syntactic level, it is primarily the function-oriented variation of sentence length, the contracted verb forms, and/or the degree of function-oriented changes of word order and sentence structure that determine the functional level of rhetorical-stylistic means.

On the textual level, the functional dimension of the rhetorical-stylistic inventory is determined by the percentage of nominal or verbal LSP text constituents (nominal/verbal style), the respective sentence linkage means, the use of certain tenses, grammatical mood, diathesis as functionally determined and stylistically relevant LSP text elements, the stylistic form of mental-linguistic communication and complex procedures, and the functional particularities of the author’s communication strategy (the integration of quotes as pieces of evidence, illustrations, theses and/or quotations in order to express one’s ironic and critical stance on the subject matter at hand). In natural science and technical LSP texts, the high level of content-related precision and the labelling of the text’s inherent logical congruity can cause the text to be dominated by the nominal style, causal types of sentence relations, and passive structures (Lauren/Nordman 1996).

The functional level of the rhetorical-stylistic potential thus encompasses any linguistic and non-linguistic means that indicate the communicative partner’s ability to acquire knowledge and to act, at their present level of knowledge/or degree of specificity.

2.6. The textual level
Representative LSP text studies carried out in all three scientific disciplines at hand provided proof of the existence of rhetorical-stylistic text layout principles, which have a lasting effect on the absorption and the integration of the pieces of information in the text. In this context, the rhetorical-stylistic text layout principles feature a qualitative-functional dimension, relating to the compulsory and optional stylistic means that are integrated into the LSP text. The frequency, the distribution, and the combination of stylistic means constitute the quantitative-structural side of rhetorical-stylistic text layout principles.

The development of different rhetorical-stylistic text layout principles is primarily based on the following links:
The body of stylistic means used in the LSP text has structural and/or functional particularities. They emphasise the lack of symmetry of form and content in the field of LSP communication.

The choice and the use of rhetorical-stylistic means are closely linked to the intention, the topic, and the author’s communication strategy. During the linguistic implementation of certain contents, these factors are combined to form a text-specific pattern which secures certain communicative effects.

LSP text forms (essays, scientific magazine articles, and others) distinguish themselves through regularities in the structure and the combination of stylistic means. Apparently, it is possible in these LSP text forms to summarise groups of rhetoric-stylistic means in terms of identical function (e.g. convincing the communication partner) to formulate equivalent rhetorical-stylistic text layout principles (e.g. euphemistic/pessimistic point of view regarding items and processes of specialised reality, forming an affirmative/critical stance on specialised contents, integration/omission of personal matters, redundant/restricted illustrations etc.) (Baumann 1992: 69-70).

Investigations on the matter have shown that certain rhetorical-stylistic text layout principles predominate in natural and technical science texts (congruity of statements, omission of personal matters etc.) In conclusion, it can be said that the implementation of stylistic layout principles in LSP texts do not only bear on the efficiency of the decoding process of contained information, but also have an effect on the comprehensibility of the text.

2.7. The syntactic level

The complex cognitive structure of (specialised) knowledge which is to be transferred in the communication process among the communicative partners requires a perspectivation of their interaction, which includes a determination of form and function regarding the syntactic stylistic means.

The syntactic stylistic means focus on organising passages of the LSP text, in such a manner that the individual effort necessary to process the text be minimised, the restricted capacity of one’s memory be not overworked, and the subsequent information contained in the text conforms to the expectations of the recipient(s) (Miller 1962: 748-762; Redder/Rehbein 1999).

Technical text analyses from three different scientific complexes have shown that the following text-syntactic categories are stylistically relevant:

a) tense (the historical present tense),
b) grammatical mood (the author’s position on the level of validity of the conclusion of the text),
c) functional sentence perspective (FSP, topicalisation and rhematisation),
d) formation of ellipses,
e) syntactic stereotypes (firmly established emotional “bias”) in certain LSP-based texts forms (e.g. user manual),
f) the syntactic combination of LSP text passages and captions (images, diagrams, charts, symbols, formulas etc.),
g) the share of paratactic and hypotactic sentence configurations in the technical text,
h) sentence linkage means (anaphora + parallelism, antitheses and others),
i) reproduction of somebody else’s discourse (quotations),
j) emphases by means of inverted word order (stylistic inversion, rhetorical question and others) and
k) the logical structure of the content (question-answer-combination, rhetorical question)
Furthermore, the stylistic analyses by Hoffmann and Piotrowski (1979) have demonstrated that the syntactic stylistic means are of varying significance for the LSP-based communication process.

In social science texts they are first and foremost aimed at increasing the degree of emotionality and expressivity of the LSP-based text’s conclusion. This occurs with the help of the following strategies:

1. Securing accessibility of the relevant pieces of information in the technical text by means of emphasis (presence of consciousness),
2. Increasing the conspicuousness of relevant LSP text contents by means of topicalisation (topic-comment-structure, inversion, emphasis),
3. Stressing LSP text contents by restructuring communicative acts (adopting someone else’s perspective, referring to someone else’s viewpoints, direct speech as quotation, question-answer-sequences, as well as contrasting and repetition of statements) and
4. Modification of the LSP text author’s position (grammatical mood: subjunctive, imperative).

Syntactic stylistic means offer a wide range of possibilities to express the LSP text author’s emotional and/or mental commitment to certain contents in an efficient manner.

2.8. The semantic-lexical level

In all scientific disciplines the coordination of conceptual knowledge between the communication partners occurs by means of terminology (Budin 1996). It secures a maximum level of conceptual agreement among the participants of a communicative act.

Since the terminological system follows the precepts of the respective scientific discipline and represents the highest degree of conceptual abstraction, it facilitates optimal communication between specialists (Kalverkämper 1988: 166). Technical terms therefore represent the obligatory stylistic means of a technical text. In the field of natural sciences, these do not have an expressive colouring.

In stylistic analyses of lexis and semantics in natural science and technical science texts, it has been established that the share of technical terms in relation to the total word count varies considerably, depending on the level of subject-specificity. In this context, it was found that a high level of specificity always entailed a high percentage of technical terms (Baumann 1994: 127).

Moreover, the number of term repetitions in a technical text, the concentration of terms in certain macrostructural elements of the text, and the number and the nature of those scientific disciplines that contribute to the specialised word count are of special significance.

In text analyses of natural as well as technical science texts, it has been demonstrated by means of statistical surveys on language that the degree of subject-specificity in the text increases along with a higher percentage of specialised vocabulary in comparison to the total word count (Baumann 1994, pp. 128). As a consequence of this, text comprehension would be rendered more difficult for laymen, since they would have to activate several contexts of knowledge in their memories.

In contrast to the obligatory stylistically neutral elements of technical texts, the optional semantic stylistic means indicate individual contributions to the reflection process of the respective specialised reality (rationality vs. emotionality, metaphors, metonymy and others) when defining terms (synonymy, polysemy and others) and/or in the case of a combination of certain characteristics (hyperonym – hyponym).
A comparative analysis of lexical-semantic stylistic means in social, natural, and technical science texts has shown that the percentage and the diversity of optional semantic stylistic means is much higher in social science texts than in the other two academic spheres, where inner logic and mandatory precision during the linguistic implementation of technical contents entail a more economical use of stylistically relevant elements (Baumann/Kalverkämper 1992; 2004; Kalverkämper/Baumann 1996).

3. **Summary**
Our recent interdisciplinary empirical analyses of different *LSP text forms* (scientific article, monograph, students’ textbook), from various *social* (linguistics, history, law, economy), *natural scientific* (psychology, medicine) and *technical sciences* (technology and materials, audio engineering), from oral, written and electronic *media* and from German, English, Russian, French and Spanish *languages* have led to a lot of new insights some of which prove to be extremely significant for further interdisciplinary specialist thinking research.

4. **Literature**


