

The interrogative in contemporary Czech scientific texts

Martin Schacherl

University of South Bohemia, Czech Republic
schacherl@pf.jcu.cz

Abstract

The aim of this research on questions and interrogative sentences in theoretical scientific texts has been, alongside with an analysis of their function, to confirm their explicit (non)occurrence. In order to achieve the intended aim, the research was based on a textual corpus representing present-day Czech academic monological discourse, involving a strict selection of various genres and scientific contents. The corpus includes team and authorial monographs, which are thematically divided into five fields: technical sciences (1); sciences of inanimate nature (2); medical and biological sciences (3); humanities and social sciences (4); agricultural and biological-environmental sciences (5). Despite their low frequency, interrogative sentences regularly occur in theoretical discourse, mostly as ‘false’ questions, both yes/no and wh-question types. In humanities and social sciences thus in contemporary scientific discourse, questions and interrogative sentences are used to dynamise the emotional neutrality and rigidity of technical exposition, enhancing the textual interactivity, or activating the recipient. Therefore, the occurrence of explicitly formulated questions is rather sporadic and, as a stylistic or rhetorical tool, they are more frequently used employed in popular scientific style.

Key words: style, linguistics, theoretical and scientific discourse, questions and interrogative sentence, humanities and social sciences

The principal aim of this paper is to verify through sufficiently conclusive material whether and how questions, that is to say interrogative sentences performing the communicational function of “inquiry”, are applied in contemporary Czech monological technical communication. The intended purpose pursued in our research on questions and interrogative sentences employed in theoretical scientific texts has been, in conjunction with an analysis of their function, to confirm their explicit (non)occurrence. In addition, the end-product of our pursuit – a textual corpus – should facilitate differentiation among purposefully chosen scientific fields. Prevalent in professional discourse is obviously the monological form; whereas the “hidden” dialogical agent in technical communication,

according to Krčmová (2008, p. 211), is operative in the inclusive plural and, at the theme level, in intertextuality. Similar functions are performed in scientific discourse also by interrogative communicational expressions. Although the very formulation of the research question is a cognitive tool, its explicit incidence in theoretical scientific texts is typically rare. The academic discourse tends to be implicitly interactive and the classical interrogative mode is implemented sporadically in defiance of the indisputable intersubjectivity of scientific cognition (Holton, 1999, p. 92) and despite the discursive character of professional communication which, on the one hand, results from interaction with the hitherto state of knowledge and, on the other hand, is tailored to a specific recipient. The excerpted material will then include, apart from 'standard' questions, i.e. interrogative utterances, mainly 'false' questions, that is to say interrogatory statements which, though questions in form, for the most part fulfil other functions in the text. In linguistics, the concept of question embraces an interrogatory statement, accentuating its communicational function which implies the objective/aim of the delivered content (Karlík, 1995, p. 586), namely, the authorial intention/purpose. The interrogative utterance thus aims to "seek information the speaker is lacking and needs to enhance their knowledge of the world" (Grep, 2002, p. 537). In contrast, a question is the expression that denotes the linguistic form of a sentence, conveying its linguistic qualities (Karlík, 2002, p. 301). Stylistically, professional theoretical utterances represent prepared, carefully formulated, relatively complete, exact and clear disquisitions delivered within public linguistic communication and marked by a prevailing conceptual constituent. The wording of a technical communication is stylised with suppressed emotionality, while innovative means of expression are instrumental in conveying scientific knowledge more perspicuously. Lacking aesthetic ambition and persuasive function, academic style is rather bound to complete cognitive objectives. The fact that in professional communication the choice of expressions is stylistically and emotionally neutral is correlative with the use of standard language necessitating literary vocabulary (This description is based on the concept formulated in Krčmová, 2008, p. 208–215). The variability and specificity of human cognitive processes is naturally reflected in the professional discourse communicating information from various fields of human activity. This paper is focused on the theoretical scientific style, adjusted to the presentation of new knowledge, precise and elaborate in form and content, and directed to an erudite recipient.

Textual corpus representing present-day Czech academic monological discourse

In order to achieve the intended targets, the research generated a textual corpus representing present-day Czech academic monological discourse,

involving a strict selection of various genres and scientific contents. The anthology comprises team and authorial monographs, which are thematically divided into five Czech Science Foundation fields: (technical sciences (1); sciences of inanimate nature (2); medical and biological sciences (3); humanities and social sciences (4); agricultural and biological-environmental sciences (5). In this paper, the book resources are referred to in a simplified way, as mentioned in the bibliography, Part I. The term “contemporary scientific communication / present-day professional discourse” is restricted here to Czech academic monological discourse published virtually in the last ten years. The selection gave preference to team monographs, where the influence of subjective stylistic features can expectedly be reduced. So as to enable an evaluation of this supposition, the corpus also includes one authorial monograph. The classification according to the Czech Science Foundation fields was to reflect the linguistic differences among the selected fields as one of the factors affecting the variances in the present-day scientific language development, namely that linked with “profession” (Daneš, 1997, p. 74). The chosen discriminative principle of horizontal classification has enabled us to create an intentionally differentiated sample of texts which should support, or potentially reject, assertions long accepted by both laics and professionals that there are (can be) differences in particular monitored objectives of Czech academic monological utterances written in the respective fields and, further, that the most striking differences can be anticipated between humanities and sciences. Among others, this research also pursues comprehending the process of (linguistic) differentiation, i.e. separation of ever more specialised fields (Kraus, 1994, p. 15) within the corpus representing the contemporary Czech theoretical scientific discourse. This trend is at the same time perceived as one of the most conspicuous features in the latest implementation of Czech technical style. Examples in the text are printed in *italics*.

Questions and interrogative sentences (according to their form and function)

Excerpts from the corpus of technical texts have revealed that questions and interrogative sentences (according to form and function) are represented in most monographs across the fields. Their frequency is high, especially in the monographs produced in humanities, social sciences and technical fields, including mathematics and agricultural and environmental sciences. Their lowest occurrence has been documented in monographs completed in sciences of inanimate nature. Even if the incidence of questions in the excerpted texts (except two) is not very high, they are employed by the authors and authorial teams in all collected monographs without exception. There are hardly any noticeable differences among individual fields, nor are there marked differences between

humanities and sciences. Neither has comparative analysis proved conditionality in the relation between question sentence occurrence and generational affiliation of particular authors and teams. The non-occurrence of interrogative sentences in two monographs completed in two different fields suggests that it is a stylistic or rhetorical device whose presence in a scientific text is substantially influenced by the authorial subject. The styling of the professional content thus reveals an autonomous authorial method which probably reflects the approach of a particular team, or a particular authorial practice in writing a technical text. Interrogative sentences have not been evidenced in a politological team monograph representing humanities and social sciences and in a team monograph on meteorological fields representing sciences of inanimate nature.

Invariably 'false' questions (surprise, certainty, modality, compositional purposes)

Interrogative sentences used in academic discourse are invariably 'false' questions, i.e. structures interrogative in form but lacking in interrogatory meaning. Admittedly, one of the due considerations to the author of a professional treatise, with regard to the form and content of the text, is a specific recipient; yet, with a few exceptions, in technical writing an explicitly formulated, standard interrogative mode is a zero occurrence. A dialogue in theoretical scientific written discourse is not an exchange of ideas between two or more persons, possible questions or answers are well within the author's competence. Our excerpts have proved the incidence of both yes/no questions (*Mohou stroje myslet?* 1TEXT3, 26), allowing an affirmative or negative reply, and wh-questions (*Jaké informace lze vyčíst z fylogenetického stromu a které jsou ty nejdůležitější?* 3TEXT2, 93), allowing a reply from a wide range of possibilities. As a matter of fact, in the corpus, the wh-questions slightly prevailed (*Proč vůbec stavět nekonfigurovatelné analogové obvody?* 1TEXT3, 98). For all that, interrogative structures are used in scientific texts for expressing predominantly other functions than interrogation.

The authors employ interrogational utterances as a stylistic device to express various degrees of epistemic modes. Most frequent are 'surprise' questions expressing astonishment, both in yes/no questions (*Je p-n přechod v systému izolovaných polovodičových nanokrystalů, které mají průměr pouze několik nanometrů? Jde skutečně o projev zářivé rekombinace volného excitonu? Je takový výsledek objektivní?* 1TEXT2, 242) and wh-questions (*Jak je to tedy možné?* 1TEXT2, 25). Quite frequent in academic discourse are also 'deliberative' questions signalling various degrees of certainty – such questions contain frequent epistemic predicators (*Je možné; je zřejmé*) or modal verbs in epistemic functions (*moci; muset*). It is possible to presume that these are specific features of an individual style of a particular monograph (monographs) conveying the existing

norms and usages of authorial teams because the source materials include also texts where certainty modes are not referred to in questions. Moreover, noticeable differences can be observed in the frequency of this device among the individual authors or authorial teams of these texts.

The interaction effect, that is the reader's greater involvement in the cognitive process is obviously not produced in the selected monographs through distinct implementation of modes. The modalising lexemes' share in the chosen samples of 1000 words is: 1,7% in technical fields and mathematics; 1,5% in inanimate nature fields; 1,7% in medical and biological fields; 1,15 in humanities and social sciences; 1,13 in agricultural and biological- environmental sciences. In the chosen samples, the excerpted texts only slightly imply modality, rather tending to a categorical presentation of the scientific content, with minimal differences between particular fields or individual monographs. The low content of modality is in correspondence with the prevailing formulation patterns. The authorial plural, or impersonal style act as stylistic means to play down the author's personality and individuality, manifesting their closeness to the team and reducing the subjectivity and emotiveness of the utterance.

In Czech professional discourse, first person plural (we) has traditionally been perceived as unmarked. Out of the twelve researched monographs, ten use authorial plural (*pluralis auctoris*) or a combination with inclusive plural; in two monographs, the authors prefer impersonal structures including passive. These are team monographs completed in humanities and social sciences and an authorial monograph produced in agricultural and environmental fields. The corpus evidences zero occurrence of first person singular throughout. The overwhelming dominance of authorial plural, or non-occurrence of first person singular above all demonstrates togetherness of authorial team(s), i.e. reflects the team spirit of prevailing monographs, despite the fact that the authors of particular sections of the excerpted texts are mostly known. Analyses of our finds show that, irrespective of certain unsuitability or non-representativeness of the source materials, consisting mainly of team monographs, theoretical written discourse does not change dramatically in style and that the same can apply to current practice.

Using 'false' questions in theoretical academic discourse may even suggest irresoluteness or an alternative (*Jsou suchozemské ekosystémy zdrojem či naopak potenciálním úložištěm /sinkem) atmosférického uhlíku významného skleníkového plynu CO₂? Je tedy počítač inteligentní, pokud v šachu takřka vždy zvítězí nezávisle na člověku, který proti němu nastoupí?* 5TEXT1, 21). Very scarce in the corpus are rhetorical questions where the content factor in the text, i.e. informational saturation, is replaced by the author's personal fascination, or the text becomes more recipient-oriented. (*Není to malý zážrak?* - vztah mezi teorií

čísel a konstrukcí pravidelných mnohoúhelníků). The metatextuality, comment-like tendency of rhetorical questions, thus makes them more related to popular science than to professional theoretical communication.

In addition to the above mentioned functions, such as surprise, certainty, modality, 'false' questions fulfil mainly compositional purposes. The established model composition of academic utterance is activated by enhancing the dialogical aspect. 'Authorial' questions are applied, to a varying degree, in technical fields with mathematics, and in humanities and social sciences. In other fields, they were not represented at all, or quite exceptionally. In a professional text, the 'authorial' question is often followed by a direct (authorial) reply (*Proč tomu tak je? Protože jsme vzali v úvahu jen část problému* 1TEXT2, 149). The author explicitly formulates a question as a problem which is tackled further in the text. The subsequent answer is then related to the content of the question both affirmatively (*Je tedy model rozporuplný? ... podle toho, co jsme říkali v předchozím výkladu, by tomu patrně nemělo být!* 1TEXT2, 20) and negatively (*Znamená to tedy, že kvantitativní znaky jsou založeny také geny velkého účinku? Odpověď zní nikoliv* 3TEXT2, 271). The answers can be explicit, adopting rhetorical syntax with various degrees of reduction (*Můžeme přesto detekovat signál z jedné kvantové tečky? Ano, můžeme, podobně jako astrofyzikové měří spektra hvězd, tedy objektů menších než rozlišovací schopnost jejich optiky* 1TEXT2, 273-274), or implicit, performing the communicative duty of question only in part, by confirming or refuting the content of the question (*Co však je inteligentní systém? Definice není jednoznačná* 1TEXT3, 26). In most cases, the information conveyed in replies exceeds the information inquired and serves chiefly as an argumentative tool in further exposition (*se srovnávají pomocí tzv. alignmentu. Co je alignment? Z evolučně-biologického hlediska je alignment hypotéza* 3TEXT2, 78). The excerpts from the corpus comprise affirmative and negative answers, but no indefinite replies. Vagueness, indecisiveness or rhetorical temporising are unrepresented in technical texts. Distinctive is the repeated use of a variant question within the singular style of one monograph (e.g. *je třeba věnovat pozornost ... je lepší použít ... je takový výsledek objektivní ... je to v našem případě nutné* 3TEXT2; *co však je inteligentní systém ... co toto kritérium říká ... co je typické pro úspěšné aplikace evolučního návrhu v oblasti číselových obvodů* 1TEXT3). To a certain extent, this reflects formulational stereotypes typical of the authorial diction in a particular monograph.

False interrogative utterances

All of the examples described so far included questions which maintain the form of interrogative sentences. Fields related to inanimate nature, medicine or biology, agriculture and environmental biology, feature a much higher occurrence of 'false' questions, which deviate from the form of interrogative sentence. False

interrogative utterances enhance the expositional style through formulational strategies which apparently suggest a dialogical mode of instructive exposition. The authors use periphrastic false yes/no questions (*zda podobný přístup lze uplatnit i v křemíku, ponecháváme k úvaze čtenáři* 1TEXT2, 61) and wh-questions (*Je tedy na místě otázka, zda a jak se může stimulovaná emise projevit v různých zářivých rekombinačních dějích excitonů, popř. jejich komplexů* 1TEXT2, 61). In scientific discourse, the function of periphrastic interrogative sentences is similar to that of 'false' questions - they primarily accentuate various degrees of uncertainty, or possibly confirm designated assumptions; in any case, they always enhance the textual interactivity through dialogical patterns. Likewise, in 'false' questions that formally are not interrogative sentences, an explicitly formulated question is often followed by an authorial answer (*otázku, zda zvýšení dávky peritoneální dialýzy vede ke zlepšení přežívání, je možné zodpovědět pouze na základě výsledků randomizované kontrolované studie* 3TEXT1, 570). The responsive portion of the text often assumes the form of reply in a dialogue. The relatively narrow range of expressions used to formulate an interrogative utterance does not exceed a repeated occurrence of such phrases as *vzniká / naskytá se / nabízí se / je / pozornost poutá / posuzuje se / zůstává otázka*, conveying assumption or uncertainty; not excluded is a dependent clause containing its own modal verb *moci* (*důležitá je otázka, zda turbulence v oblaku může vyvolat třštění kapek nebo k němu významně přispět* 2TEXT1, 197) or modal expressions like *lze dosáhnout/ lze uplatnit* or *zdali / budou-li / jestli*. The meteorological team monograph reveals a repetitive incidence of phrases like *je/vzniká otevřená/nápadná otázka*, the medical team monograph displays expressions like *je/dát otázka/u, zda*. Modal expressions mostly serve descriptive functions, specifying the potentiality of an objective situation. Only sporadically do they serve a prescriptive function as the author expresses a various degree of uncertainty about the objective reality, i.e. conveys a degree of epistemic stand on the validity of the communicational content. The communicative inquiry expressed in academic discourse through a question, or an interrogative utterance, most frequently fulfils compositional purposes and represents varying compositional strategies the author uses to produce the text. There are no prominently apparent differences among the defined fields, or may be, authors. A wider scope of 'false' questions is only typical of monographs in humanities and social sciences, where questions and interrogative utterances are a forceful stylistic means to enliven the exposition and, parallel to it, to express some extent of emotionality. In view of the fact that they were represented solely in one of the two monographs produced in this field, it can be assumed that it is a purely subjective stylistic feature reflecting the authorial experience in writing scientific texts, or possibly their personality.

Conclusions

Despite their low frequency, interrogative sentences occur regularly occurrence in theoretical discourse, mostly as 'false' questions, both yes/no and wh-question types. According to the form and communicational purpose, the authors of professional utterances employ questions as a stylistic means to primarily formulate an academic content. By including interrogative sentences they enliven technical discourse, making it more acceptable for the recipient through interactivity and removing a suppositional rigidity through the author's increased zeal. Concomitantly, questions are used as a convenient means to express various degrees of uncertainty about the delivered professional content. A wider scope of 'false' questions is only typical of monographs in humanities and social sciences, where questions and interrogative utterances are a forceful stylistic means to enliven the exposition and, parallel to it, to express some extent of emotionality. Thus in contemporary scientific discourse, questions and interrogative sentences serve to dynamise the emotional neutrality and stiffness of technical exposition, enhancing the textual interactivity, or activating the recipient. But the primary task of authors of technical texts is to inform about their research, formulating the results, or proposing solutions and further procedures, appraising the hitherto level of knowledge, or perhaps (dis)approving of it. Their intention is to formulate an exact, unambiguous, disinterested and fact-embracing communication. Therefore the incidence of explicitly formulated questions is rather sporadic and, as a stylistic or rhetorical tool, they are more frequently employed in popular scientific style.

List of analysed texts

- Flajšhans, M., Kocour, M. et al. (2013). *Genetika a šlechtění ryb*. 2. extended and amended edition. České Budějovice: University of Bohemia in České Budějovice. (3TEXT2)
- Horníčková, K. & Šroněk, M. (Eds.). (2010). *Umění české reformace*. Praha: Academia, (4TEXT2)
- Chlupáč, I., Brzobohatý, R., Kovanda, J., & Stráník, Z. (2011). *Geologická minulost České republiky*. 2nd expurgated edition. Praha: Academia. (2TEXT2)
- Kolejka, J. (2013). *Nauka o krajině: Geografický pohled a východiska*. Praha: Academia. (5TEXT2)
- Křížek, M., Somer, L., & Šolcová, A. (2009). *Kouzlo čísel: Od velkých objevů k aplikacím*. Praha: Academia. (1TEXT1)
- Marek, V., Michal aj. (2011). *Uhlík v ekosystémech České republiky v měnícím se klimatu*. Praha: Academia. (5TEXT1)

- Pelant, I. & Valenta, J. (2010). *Luminiscenční spektroskopie. II: Nanostruktury, elektroluminiscence, stimulovaná emise*. Praha: Academia. (1TEXT2)
- Řezáčová, D., Novák, P., Kašpar, M., & Setvák, M. (2007). *Fyzika oblaků a srážek*. Praha: Academia. (2TEXT1)
- Sekanina, L. et al. (2009). *Evoluční hardware: Od automatického generování patentovatelných invencí k sebemodifikujícím se strojům*. Praha: Academia. (1TEXT3)
- Tesař, V., Schuck, O. aj. (2006). *Klinická nefrologie*. Praha: Grada Publishing. (3TEXT1)
- Vodička, K. & Cabada, L. (2011). *Politický systém České republiky: Historie a současnost*. 3rd updated and extended edition. Praha: Portál. (4TEXT1)
- Vrška, T. et al. (2002). *Dynamika vývoje pralesovitých rezervací v České republice*. Praha: Academia. (5TEXT3)

References

- Cvrček, V., Kováříková, D., Mácha, J., & Křen, M. (2011): *LINK: korpus odborných lingvistických textů, verze 2 z 6. 5. 2011*. [online]. Institute of the Czech National Corpus, Faculty of Arts, Charles University. Accessible from: <http://www.korpus.cz>.
- Čechová, M., Krčmová, M., & Minářová, E. (2008). *Současná stylistika*. Praha: Lidové noviny Publishing House.
- Čechová, M. (2005). Proměny současných odborných komunikátů. *Stylistyka XIV*, 287-294.
- Čermík, F. (2011). *Jazyk a jazykověda*. Praha: Karolinum.
- Čmejrková, S., Daneš, F., & Světlá, J. (1999). *Jak napsat odborný text*. Praha: Leda.
- Daneš, F. (Ed.). (1997). Jazyk vědy. In *Český jazyk na přelomu tisíciletí*, pp. 68-83. Praha: Academia.
- Filipec, J. aj. (2014). *Slovník spisovné češtiny pro školu a veřejnost*. X. Amended and updated edition. Praha: Academia.
- Filipec, J. & Čermák, F. (1985). *Česká lexikologie*. Praha: Academia.
- Galtung, J. (1981). Structure, culture, and intellectual style: An essay comparing saxon, teutonic, gallic and nipponic approaches. In *Sociale Science Information*, 20. 6. 1981, pp. 817-856.
- Holton, G. (1999). *Věda a antivěda*. Praha: Academia.
- Jelínek, M. (1955). Odborný styl. In *Slovo a slovesnost*. 16(1), 25-37.
- Karlík, P., Nekula, M., & Pleskalová, J. (Eds.). (2002). *Encyklopedický slovník češtiny*. Brno: Lidové noviny.
- Karlík, P., Nekula, M., & Rusínová, Z. (Eds.). (1996). *Příruční mluvnice češtiny*. 2. vyd., opr. Praha: Lidové Noviny Publishing House.
- Kraus, J. aj. (1998, 2000). *Akademický slovník cizích slov*. Praha: Academia.

- Kraus, J. (1994). K současným vývojovým proměnám vědeckého a odborného vyjadřování. In *Naše řeč*. 77(1), 14-19.
- Krčmová, M. (2008). Pojmovost jako konstituující faktor projevu. Funkční styl odborný. In Čechová, M., Krčmová, M., & Minářová, E., *Současná stylistika*, pp 208–229. Praha: Lidové noviny publishing house.
- Křen, M., Bartoň, T. et al. (2010). *SYN2010: žánrově vyvážený korpus psané češtiny*. [online]. Praha: Institute of the Czech National Corpus, Faculty of Arts, Charles University., 2010. Accessible from: <http://www.korpus.cz>.
- Mareš, P. (2013). Podoby českého vědeckého stylu. In *Přednášky z 56. běhu Letní školy slovanských studií*, pp. 37-47. Praha: Univerzita Karlova.
- Mistrík, J. (1997). *Štylistika*. Bratislava: SPN.
- Tešitelová, M aj. (1983). *Psaná a mluvená odborná čeština z kvantitativního hlediska (v rámci věcného stylu)*. Praha: ÚJČ ČSAV3.

Contact

PhDr. Martin Schacherl, Ph.D.
University of South Bohemia
Jeronýmova 10
371 15 České Budějovice
Czech Republic
schacherl@pf.jcu.cz