

## CHAPTER SIX

# THE CHOICE BETWEEN GENERIC SCIENTIFIC TERMS IN LINGUISTIC RESEARCH ARTICLES WRITTEN IN FINNISH

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### Abstract

While researchers use a lot of space in their articles for defining terms, generic scientific terms are often used without definition. The terms ‘theory’, ‘hypothesis’, ‘method’, and ‘model’, for example, are assumed to be self-explanatory and their meaning is only rarely defined in research articles. The use of these terms in scientific discourse, however, is not without ambiguity. I investigated the different factors that may affect choices among generic scientific terms in the field of linguistics, applying a mixed-methods approach. In the first stage, a study was conducted based on 23 responses by Finnish linguists to a questionnaire concerning differences between these terms (Luodonpää-Manni 2013). The second stage, presented here, consisted of applying the results of the previous study to an authentic research article corpus, consisting of sixty linguistic articles written in Finnish. The type of sequential strategy adopted allows us to uncover the factors affecting choices among generic scientific terms according to hermeneutic principles, in relation to concepts considered meaningful by researchers themselves. The findings suggest that the choice between generic scientific terms is influenced by a number of conceptual and stylistic factors, ranging from different epistemic traditions to stylistic creativity.

**Keywords:** academic discourse, mixed methods approach, scientific terms, Finnish

## 1. Introduction

Scientific constructs of the meta-scientific type are designated in research articles by a variety of generic terms, such as ‘theory’, ‘hypothesis’, ‘method’, and ‘model’. Generic scientific terms are abstract, non-specialized terms that are not exclusive to scientific discourse; in scientific usage, however, they refer to certain fundamental concepts and processes involved in scientific activity, and are probably used in every scientific discipline. Despite the fact that generic scientific terms are at the heart of the argumentation related to scientific activity, they have been subject to surprisingly few linguistic studies (see, however, Phal 1971; Drouin 2007; Pecman 2007; Cavalla & Grossmann 2005). Some of these terms have been subject to ample discussion in the fields of methodology and philosophy of science (see e.g. Carnap 1971; Hanson 1961; Kuhn 1994 [1962]; Popper 1995 [1963]; Niiniluoto 1980, 1983, 1984). The treatment of the terms in these fields, however, is theoretical and normative, and does not question the actual use of the terms in scientific practice. Thus, the linguistic studies concentrating on the authentic use of the terms, such as the present paper, have a lot to offer to the study of science especially when it comes to the actual writing practices and the use of these terms. The interest in metatheoretical questions in general seems to be growing inside (Finnish) linguistics, as shown by the recent works by Määttä (2000abc), Konstenius (2014), and Möttönen (2016), for example.

Despite the traditional ideals of scientific discourse, such as clarity and unambiguity, earlier research has shown that the use of these terms in linguistics is not without ambiguity (e.g. Konstenius 2014; Rinck 2006; Cavalla & Grossmann 2005). According to Cavalla and Grossmann (2005, 47), what is understood by these terms may vary between different epistemic traditions, national cultures, and academic genres. Indeed, ‘theory’ may be understood as the systematic presentation of a phenomenon to be tested (e.g. Hempel 1966, 70–84), or as an abstract foundation of the work that can only be assessed in terms of its utility to the research (e.g. Silverman 2010, 109–110). On the other hand, similar scientific constructs may be referred to by different terms. A scientific explanation that is not considered entirely certain, for example, may be referred to as a ‘theory’, a ‘model’, or a ‘hypothesis’ (Luodonpää-Manni 2013).

The purpose of this article is to examine the factors that influence the choice among generic scientific terms in linguistic research articles. The discipline of linguistics, understood here in a broad sense as the study of natural language(s), presents an interesting object of study because of its

position at the interface of the humanities and the natural sciences (Poudat 2006, 64). Since the methodology of linguistics is influenced by both domains of scientific research, it is interesting to observe how this duality is reflected in the use of generic scientific terms and in the fundamental conceptions of scientific activity these uses express and emphasize. The study of the use of these terms is necessary and useful to the self-understanding and self-criticism of our discipline as well.

Since the research article may generally be viewed as a good representative of academic discourse (e.g. Swales 2004), I have chosen this discourse genre as the material for this study. The material consists of sixty peer-reviewed research articles written in Finnish and published in scientific journals between 2000 and 2010. Finnish academic discourse has been less widely studied than English, often described as the *lingua franca* of the scientific community. Due to the international nature of science and the dominant position of English, it is likely that the use of scientific terms in Finnish is influenced by the use of the corresponding terms in English. That question, however, is outside the scope of this article.

According to Dirven and Verspoor (2004, 43), “the selection of a name for a referent is simultaneously determined by both semasiological and onomasiological salience”: how typical the referent is considered of the category, and how entrenched the name is for that category. Since these questions (especially the first) cannot be directly answered by corpus-analysis, I adopted a sequential strategy. In the first stage, a survey was conducted in which 23 Finnish linguists, in different stages of their academic careers, answered a questionnaire concerning the differences between twelve generic scientific terms: *teoria* ‘theory’, *hypoteesi* ‘hypothesis’, *malli* ‘model’, *metodi* ‘method’, *teesi* ‘thesis’, *lähestymistapa* ‘approach’, *viitekehys* ‘framework’, *lähtökohta* ‘starting point’, *näkökulma* ‘point of view’, *suuntaus* ‘orientation’, *tarkastelutapa* ‘manner of examination’, and *menetelmä* ‘method’ (Luodonpää-Manni 2013). The meanings associated with these terms as a result of a conscious thought, however, do not necessarily coincide with their use in authentic situations. The second stage (presented here) therefore consisted of implementing the results of the survey with respect to authentic material. Special attention was paid to the choice between four of these terms – ‘theory’, ‘hypothesis’, ‘model’, and ‘method’ – which are among those most firmly established as generic scientific terms.

The results of the study suggest that the variation in the use of the terms is clearly motivated. The choice among generic scientific terms is influenced by a number of conceptual and stylistic factors (see Geeraerts

1988), ranging from different epistemic traditions to stylistic creativity. The findings nevertheless suggest that linguistics as a discipline would benefit from more elaborate metatheoretical reflection.

## **2. Functional perspective on terminology**

Traditionally, clarity and precision of expression have been seen as ideals in scientific language (see e.g. Temmerman 2000, xiv). In the case of scientific terms, this has often meant adopting the principle of monosemy as the basis for terminological description, whereby within a particular field or discipline, a given term has only one meaning. The traditional theory of terminology is associated with the name of Wüster and his successors (especially Felber 1984), and was developed in close relation to the Vienna school of logical positivists (see Temmerman 2000, 2–3). According to this view, a concept exists independently of the term whose meaning it expresses (Felber 1984, 103). Concepts (and their meanings) are located in the extralinguistic world, and their naming is considered to involve the deliberate choice of a term. This traditional position reflects an objectivist vision of the world, according to which terms refer directly to the real world, as simple labels used to name entities in this world (see e.g. Kleiber 1999, 19; Honeste 2012, 60).

The rationales offered in traditional terminology theory in justification of the univocity principle (any given term corresponds to a single concept and vice versa) are understandable, and this approach is useful in the development of standardized terminologies (e.g. ISO). In its efforts to achieve the ideal of univocity, however, traditional terminology ignores the role of human conceptualization in the interpretation of experience, and assumes that we have direct access to an objective reality. As our only access to reality is by way of our sensory and cognitive systems, our perception is always filtered by our conceptualization. The traditional conception of terms must thus be considered idealized and unrealistic (Temmerman 2000, 219; Pearson 1998, 7).

As in much recent work on terminology, including that based on socioterminological approaches (Gaudin 2005, 81–82; Gambier 1987; 1991) or socio-cognitive ones (Temmerman 2000), the basic principle in this study too is that terms need to be considered in relation to their authentic use (usage-based approach). Studies of the actual use of terms have shown that it is in fact rare for a given term to correspond to just a single meaning (e.g. Depecker 2005, 12; Gambier 1991, 8–9; Temmerman 2000, 16). According to Gaudin (2005, 86), this kind of ambiguity arises from the expansion of the sphere of usage of a term, which calls for a

renegotiation of its meaning. This position is in line with the view of Bréal (1921 [1897], 140), for whom language is a matter of collaboration, and every abstract word is in “danger” of changing its meaning in “passing from mouth to mouth”. According to Bréal (*ibid.*, 180–181), the words created by scientist and scholars are not much more precise than this. They are in the service of thought, and their meanings contract or expand, become more restricted or more general, in the course of their users’ experience.

Unlike normative definitions, functional definitions focus on shared habits of term usage (Pearson 1998, 33). The meanings of terms grow out of social practices, and may change with changes in the surrounding reality (Gambier 1987, 319; see also Bréal 1921 [1897]). A sufficient mutual understanding is achieved by the social control of meaning (Gaudin 2005, 86). Functional descriptions of terms are the outcome of a balancing act between a respect for variation and the need for mutual understanding (Rousseau 2005, 101).

In functional approaches to terminology, ambiguity is thus not usually considered a problem but may in fact be regarded as functional. According to Piantadosi, Tily, and Gibson (2012), ambiguity may even increase the efficacy of communication when the context is informative as to meaning. In the case of research articles, the anticipated readers are specialists, who possess the context to support their interpretation, and genuine misunderstandings are thus not likely to arise very often. On the contrary, ambiguity allows the author to recycle terms that are already familiar to everyone, thus eliminating the need to create a new term. This is efficient: according to Levinson (2000, 29), inference is always cognitively easier than the careful articulation of a message. On the other hand, synonymy allows the author to express fine-grained nuances (Gambier 1987, 319; Temmerman 2000, 132–133) and precise cognitive specification. The terms *climate change* and *global warming*, for example, are used to designate the same phenomenon, but choosing one of them rather than the other allows the speaker to specify his/her conceptualization of the phenomenon with precision. Here I consider naming to be closely related to conceptualization and categorization: naming certain types of entities by one term rather than another is an act of dissecting the experienced reality into elements that are considered somehow relevant. This illustrates the point made by Gaudin (1993, 77), that terminological description needs to move from lexical structure to the structuring of experience.

While in traditional terminology terms are viewed as labels for the corresponding concepts, in functional approaches, such as that adopted here, a term is regarded as a linguistic sign, consisting of a name together

with its meaning (e.g. Gaudin 2005, 81–82). In other words, terms are considered here as indivisible packages, uniting the name and the meaning content (or concept, if preferable). The fundamental difference between these two conceptions of terms is that while in the traditional approach terms serve merely as names for the corresponding concepts, the treatment of terms as linguistic signs allows us to consider their role in the conceptualization of the concept. While the physical and social environment has discursive consequences, discourse itself also has the capacity to construct the reality. It is therefore not without importance how we use generic scientific terms, inherently associated with the fundamental processes of scientific activity, since these discursive practices participate in the construction of our conception of scientific research in general.

### 3. The mixed methods approach

The material of the study consisted of sixty linguistic research articles written in Finnish (365,807 words). The articles were published between 2000 and 2010 in three peer-reviewed journals: *Virittäjä*, the *AFinLA Yearbook* and *Puhe ja Kieli* [‘Speech and Language’]. In order to have the sample represent as broad a range of linguistic research as possible, different types of articles were chosen, in theoretical and applied linguistics, discourse analysis and corpus linguistics, and dealing with a wide variety of linguistic topics. All the articles were by different authors. Aside from these criteria, no other conditions were applied in collecting the articles. The material thus includes for instance articles written both by established scholars and by doctoral students.

The generic scientific terms analyzed here share a capacity to designate different kinds of scientific constructs of the metascientific type (see Tutin 2013, 41). The terms appear in particular in the metadiscursive parts of the articles, where the writers define the theoretical foundations of their work and explain how the study was conducted. In other words, generic scientific terms are used to refer to the various types of theoretical and methodological constructs that appear in the articles. Since this definition is broad and qualitative in nature, candidates for the terms were identified by a manual search of all sixty articles. Based on a pilot study carried out in 2009 with doctoral students from Åbo Akademi and Turku Universities, twelve terms and expressions were selected for closer study, shown in Table 3.1. An automatic search was carried out to collect all occurrences of these terms in the research material.

**Table 3.1.** Occurrences of the terms and expressions selected

<b>Terms</b>	<b>Occurrences</b>
<i>näkökulma</i> ‘point of view’	304
<i>malli</i> ‘model’	191
<i>metodi</i> ‘method’	33
<i>menetelmä</i> ‘method, means’	127
<i>lähtökohta</i> ‘starting point’	106
<i>hypoteesi</i> ‘hypothesis’	21
<i>oletus</i> ‘hypothesis, assumption’	70
<i>(viite)kehys</i> ‘framework, frame of reference’	86
<i>suuntaus</i> ‘orientation’	83
<i>teoria</i> ‘theory’	79
<i>lähestymistapa</i> ‘approach’	57
<i>teesi</i> ‘thesis, assumption’	3
<i>kuvaustapa</i> ‘manner of examination’	1
<b>Total</b>	<b>1161</b>

On the continuum between common and specialized language, these terms and expressions are located in the middle: they are used both in scientific discourse and in everyday language. Not all of them, however, occupy the same level of terminological specification. Especially the terms ‘theory’, ‘hypothesis’, ‘model’, and ‘method’ have a more established status in scientific discourse than for example ‘approach’ or ‘(theoretical) framework’. This is shown by the fact that these four terms are frequently discussed in the literature on the philosophy of science or on research methodology (e.g. Hanson 1961, 1976; Kuhn 1994 [1962]; Popper 1995 [1963]; Hempel 1966; Carnap 1971; Niiniluoto 1980, 1983, 1984; Konstenius 2014). Since a high number of terms would not allow for detailed semantic analysis, here I focus primarily on the choice among these four most established terms. It is worth noting that ‘hypothesis’ and ‘method’ have two variants in Finnish scientific discourse, one an international loan, the other its close native equivalent.<sup>ii</sup>

In order to account for the factors that influence the choice among generic scientific terms, a sequential strategy was adopted. The sequential strategy is a variant of the mixed methods approach:<sup>iii</sup> the analysis is based on the results of a previous study, conducted using a different method than in the research that follows (see Creswell 2014, 224–227). As the motivations of researchers behind the use of generic scientific terms cannot be identified from the written product alone, they were determined on the basis of a questionnaire survey, where 23 Finnish linguists were

asked about their conceptions of twelve generic scientific terms (Luodonpää-Manni 2013). In the second phase of the study, presented here, the results of the previous study were implemented in analyzing the material representing the actual use of these terms.

There are at least three advantages to the type of sequential strategy adopted. First, analyzing the material in relation to the concepts mentioned by the linguists ensures that the factors proposed as affecting the choices among the terms are actually meaningful to the researchers themselves, rather than merely reflecting the ideas of the person analyzing the material. According to Raukko (2003), questionnaires allow the linguistic analysis to avoid the risk that the semantic description will diverge too much from the conceptions of native speakers, keeping it in line with socially shared representations. Second, applying different methods leads to a better and more profound understanding of the phenomenon (Flick 2004, 179). With two independent methods, information becomes available supplementing that obtained by either method alone. While the questionnaire offers important and otherwise unobtainable information as to the understanding of these terms by researchers, it is not necessarily the case that the factors offered as a result of conscious reflection correspond directly to the use of the terms in an authentic context. An analysis of the actual use of the terms is thus essential, and completes the results gained by the other method. Finally, a mixed methods approach is considered to increase the validity of the research (Flick 2004, 183; Konstenius 2014, 66). Where the results received by two independent methods converge, the relevance of the results is consolidated.

In the questionnaire, the participants were asked to answer eleven open-ended questions concerning twelve scientific terms and expressions (see Appendices A and B). The participants were invited to explain the differences between the terms ‘theory’ and ‘method’, ‘theory’ and ‘hypothesis’, ‘theory’ and ‘model’ etc. The comparison between the terms is based on the observation of Vanhatalo (2005, 28), according to whom fine semantic differences between words are best revealed in comparison with their closely related terms (see also Fuchs 2007). While the generic scientific terms in question here do not generally represent close synonymy, such comparisons may nevertheless offer essential information as to their conceptualization and the relationships among them. This would not have been achieved by collecting simple definitions for these terms. Providing definitions would have probably been a more difficult task for the participants, and could have led to the mere repetition of conventional, ready-made definitions. This would not have been desirable in a study dealing with the conceptualization by linguists of these terms and the



relationships among them. The term ‘theory’ was chosen as the starting point for the comparison because generic scientific terms often appear in the part of a research article devoted to describing the theoretical framework of the study.

In their answers to the questionnaire, Finnish linguists reported differences in the perceived scope, coherence, certainty, stability, and abstraction of the scientific constructs with which these terms are typically associated. The differences among the terms were also considered to be partly a question of taste. Here these factors are taken as the starting point of the analysis of the material representing authentic use of the terms. The analysis proceeds in a comparative fashion, in order to discuss how these factors allow for explaining the choice between neighboring terms. The analysis, however, is not restricted to these factors alone but is supplemented by other factors that are present in the material and affect the choice between terms. It is interesting to see to what extent the factors mentioned by researchers are able to explain the actual use of the terms.

The use of generic scientific terms cannot be studied – at least without losing essential information – without consideration of epistemological questions. Definitions for the generic scientific terms are suggested in textbooks on research methodology, as well as in the courses in the philosophy of science taken by the majority of researchers at some point in their university education. Although the epistemological literature is used in the analysis to account for the influence of such metascientific prior knowledge and to provide explanations for the use of generic scientific terms, the purpose of this paper is not to suggest normative descriptions; rather, my purpose is to show why variation in the use of generic scientific terms may in fact be considered functional.

#### **4. Factors explaining the choice between generic scientific terms**

The authentic use of generic scientific terms in linguistic research articles is not without its ambiguity and imprecision. On the one hand, a particular term may be used to designate different kinds of scientific constructs; on the other, different terms may be used to refer to similar scientific constructs. What, then, are the factors contributing to the choice of one term over another? The naming of scientific constructs in authentic research articles cannot be explained by a single factor. While these factors are discussed here in individual sections, assigning a name to a scientific construct is always the outcome of interaction among multiple factors.

#### 4.1. Degree of certainty and stability

According to a widely accepted view of science (see e.g. Konstenius 2014; Niiniluoto 1984), scientific knowledge is always fallible and subject to revision. Propositions once considered relatively certain, such as the idea that the sun revolves around the earth or that burning materials release a substance called phlogiston, have been shown to be wrong. As the absolute truth is generally considered by scientists to be an unrealistic goal, confirmation of scientific claims is always partial. Even a large number of observations supporting a scientific claim can never verify it definitively; in principle, it is always possible that a counter-example will be found in the future (see. e.g. Hempel 1966, 8, 27–28). Therefore, according to Popper (1995 [1963], 55–58), perceptions can only offer provisional support for the scientific claims. This conceptualization of science can be seen in (1)–(3), showing that the terms ‘theory’, ‘model’ and ‘hypothesis’ may all be used for scientific explanations of phenomena that are seen as uncertain and in consequence need to be substantiated (emphasis and English translation added):

Nämä kielitieteelliset tutkimustulokset **tukevat teoriaa** siitä, että dyslektikkolapsilla voi olla ongelmia muodostaa sanan äänneasusta täsmällinen edustus. (Lingfin40<sup>iv</sup>)

‘These linguistic research results **support the theory** that dyslexic children may have difficulties in the formation of a precise representation of the phonetic form of the word.’

- (1) Liddellin (2003a, 2003b) esittämää kuvailevien verbien **kuvausmallia vahvistaa** Emmoreyn ja Herzigin (2003) tarkkaan kontrolloitu tutkimus [...]. (Lingfin55)

‘The **descriptive model** of descriptive verbs presented by Liddell (2003a, 2003b) **is supported** by the rigorously controlled study of Emmorey and Herzig (2003) [...].’

- (2) Avainsanalista alkanut **oletus ystävyys**-sanan keskeisyydestä **vahvistui** sanalistojen, kollokaatioiden, sanaklustereiden, yhdyssanojen ja lopulta aktanttirakenteen analyysissä. (Lingfin6)

‘The **hypothesis** based on the list of keywords concerning the central role of the word *ystävyyys* [‘friendship’] **was reinforced** by the analysis of word lists, collocates, clusters, compounds and the actantial structure.’

In these examples, empirical findings are used to support the validity of scientific claims referred to as ‘theory’, ‘model’, and ‘hypothesis’. The observation that these terms may be used in similar contexts suggests that their semantic potential is at least partially overlapping.

There are, however, differences in the degree of certainty among the scientific constructs typically referred to as ‘theory’, ‘model’, and ‘hypothesis’. In their answers to the questionnaire, Finnish linguists suggest that the main difference in the use of the terms ‘theory’ and ‘hypothesis’ lies precisely in their degree of certainty (Luodonpää-Manni 2013, 251). Generally speaking, scientific constructs referred to as a ‘theory’ are considered to be more certain than those referred to as a ‘hypothesis’. The material representing the authentic use of these terms supports these interpretations. Scientific constructs referred to as ‘theories’ are discussed primarily in relation to their (high) degree of stability; in contrast, those referred to as ‘hypotheses’ are often qualified by their (low) degree of certainty and stability:

- (3) Tulos on yllättävä ja **alkuoletuksieni vastainen**. (Lingfin36)

‘The result is surprising and **contradicts my initial hypotheses**.’

- (4) Eksperimenttien avulla epärointiänteiden kestot, yleisyys ja sijainti on pystytty selvittämään hyvinkin tarkasti, mutta niiden vuorovaikutustehtävistä aidossa keskustelutilanteessa on voitu esittää **ainoastaan hypoteeseja** (ks. esim. Lalljee & Cook, 1974; Swerts, 1998; vrt. Clark & Fox Tree, 2002). (Lingfin32)

‘By means of experimentation, the durations, frequency and position of sounds of hesitation have been examined very carefully, but descriptions of their interactional functions in authentic conversational situations have been possible **only in the form of hypotheses** (see e.g. Lalljee & Cook, 1974; Swerts, 1998; cf. Clark & Fox Tree, 2002).’

In these examples, the claims designated by ‘hypothesis’ are characterized as preliminary and are not considered to be entirely reliable. ‘Hypotheses’ are contrasted with the results of the study (4) or are presented in a slightly pejorative manner as mere speculation (5). In the material, the term ‘hypothesis’ is typically attributed to scientific claims whose degree of certainty is considered low. These claims are useful for the research because they allow for suggesting explanations for

phenomena not explicable by existing explanations (Niiniluoto 1983, 227). The accuracy of the claims may then be tested using a scientific method. Where the observations are in contradiction with the claims, these claims may be rejected or modified in order to better correspond with the data (Lakatos 1970).

The difference in the degree of certainty associated with scientific constructs referred to as ‘theory’ and ‘hypothesis’ can in fact also be illustrated by the functions they are given in the research. While the authors typically test the validity of scientific claims referred to as ‘hypotheses’ (6), the direct testing of ‘theories’ is not mentioned in the material (although it should be noted that the testing of a ‘hypothesis’ typically tests a ‘theory’ at the same time, see 4.2.). Rather, these scientific constructs are often utilized in the research as such (7):

- (5) Vaikka dyslektikkojen temporaalista prosessointia on selvitetty useassakin kansainvälisessä tutkimuksessa (ks. esim. Farmer & Klein, 1995), mitään yksiselitteistä tietoa ei ole olemassa ehdotetusta temporaalisen prosessoinnin ongelmasta dyslektikoilla, ja siksi tätä **hypoteesia selvitettiin kokeellisten testien avulla** Richardsonin (1998) tutkimuksessa. (Lingfin40)

‘Although the temporal processing of dyslexics has been examined in a number of international studies (see e.g. Farmer & Klein, 1995), there is no unambiguous information as to the suggested problems of dyslexics in temporal processing, and this **hypothesis was therefore examined by means of experimental tests** in the study (1998).’

- (6) **Tulkitsenkin** tiedotteiden merkityksiä **systemis-funktionaalisen kieliteorian mukaisesti** (Halliday 1994, ks. myös Eggins 1994). (Lingfin4)

‘**I interpret** the meanings of the press releases **according to the systemic-functional theory of language** (Halliday 1994, see also Eggins 1994).’

The observation that scientific constructs referred to as ‘theory’ are often used to support research, rather than being used for objects to be tested, may be related on the one hand to their perceived degree of certainty, on the other hand to certain epistemological aspects. In the methodology of the human sciences, ‘theory’ is often understood in a

framework whereby it is not considered primarily in relation to its correspondence to observations; rather, the relevance of a ‘theory’ is evaluated in terms of its usefulness for the research (e.g. Silverman 2010, 109–110). The task of a ‘theory’ is to systematize the phenomenon studied, to fill voids in the scientific study, and to link the results to a larger context (Eskola & Suoranta 1999, 80; see also Creswell 2014, 64) as well as to enrich the theoretical discussion. In the material, ‘theories’ are in fact regularly characterized as the foundation on which the treatment of the material is based:

- (7) Näissä tutkimuksissa hän on **ottanut kohteliaisuusteorian lähtökohdaksi pyrkiessään selvittämään**, kuinka kielenkäyttäjät erityyppisissä vuorovaikutustilanteissa ottavat huomioon omansa ja toisen puhujan kasvot. (Lingfin16)

‘In these studies, his analysis of language-users’ facework in various types of interactional situations **is based primarily on politeness theory.**’

In (7) and (8), the validity of the scientific construct referred to as a ‘theory’ is not being directly tested but is used as research support, to provide a basis for classifying the phenomenon studied. The scientific constructs in question, i.e. Hallidayan systemic-functional theory (7) and the pragmatic politeness theory derived ultimately from the work of Brown and Levinson (8), are well known in the linguistic community. These constructs are probably viewed as relatively well established, supporting the claim that this term is associated with scientific constructs whose perceived degree of certainty and stability is relatively high. Their application offers the researcher a solid basis for argumentation, along with the conceptual apparatus necessary in the research itself.

The relevance of the degree of certainty and stability in the naming of scientific constructs is further illustrated by the terms assigned by the authors to their own findings. As the term ‘theory’ is typically attributed to well-established scientific constructs, the authors in the material rarely present their own results as ‘theories’. Rather, it is not uncommon to use ‘hypothesis’ or ‘model’ for constructs suggested by the author to explain a phenomenon:

- (8) **Analyysin tuloksena esitetään kieliopillistumishypoteesi**, jonka mukaan vaikka-konjunktio on keskustelussa syntaktistunut lausumapartikkeli. (Lingfin25)

**‘As a result of the analysis a grammaticalization hypothesis is put forward,** according to which the conjunction vaikka [(al)though] is a discourse marker which is grammaticalized [lit. syntacticalized] in conversation.’

- (9) Tässä artikkelissa luodaan katsaus painotusten käsittelyyn suomen varhaisemmassa puhesynteesitutkimuksessa ja **esitellään kehittämämme lausepainomalli.** (Lingfin57)

‘In this article, we survey the treatment of stress in previous Finnish speech-synthesis research and **present a model of clause-stress developed by ourselves.**’

- (10) **Näin olen pystynyt luomaan jonkinlaisen mallin** siitä, miten nykysuomen ”murrekartta” jäsentyy erilaisten identiteettien mukaan. (Lingfin22)

**‘I have thus been able to construct a provisional model** of the structuring of the “dialect map” of modern Finnish according to various identities.’

In these examples, the results of the study are presented as ‘hypotheses’ or ‘models’. Since the name ‘hypothesis’ is typically assigned to scientific constructs that are not considered entirely reliable, referring to the results of the study as ‘hypotheses’ allows the author a type of hedging, seen as a fundamental property of scientific writing and a form of argumentation that increases the credibility of the research (e.g. Meyer 1997; Hyland 1996ab, 1998). By choosing the term ‘hypothesis’ to describe the results of the study, the author is implying that the results need to be further tested for reinforcement. Likewise the term ‘model’ can evidently be assigned to scientific constructs that are viewed as less established than those referred to as ‘theories’. On the other hand, in (10) and (11) the use of the term ‘model’ may be explained by the illustrative nature of scientific constructs designated by this term, especially “the dialectal map” (11). The illustrative nature of scientific constructs named ‘model’ is further discussed in Section 4.3.

## 4.2. Scope of scientific constructs

In their answers to the questionnaire, Finnish linguists also defined the differences between the terms ‘theory’ and ‘hypothesis’ in relation to the

scope or extension of the scientific constructs these terms are used to name: ‘theory’ was generally said to be used for ‘larger’ scientific constructs than ‘hypothesis’ (Luodonpää-Manni 2013, 251). The actual use of these terms in the present material supports the claim that the perceived extent of the scientific construct is an important factor in explaining the choice between these terms: ‘hypothesis’ is typically used to designate an individual assertion concerning a phenomenon (12), whereas ‘theory’ is typically used for a larger, systematic presentation of a phenomenon (13):

- (11) **Hypoteesini on, että** vaikka-lekseemillä on eri toimintatyyppisiin hakeutuvia käyttötapoja, jotka ovat osoitettavissa keskenään polyseemiseksi. (Lingfin25)

‘**My hypothesis is that** the uses of the lexeme *vaikka* [(al)though] tend towards various types of activity, and can be shown to be polysemous.’

- (12) Näissä luvuissa **analyysi pohjautuu pitkälti Hallidayn systeemifunktionaaliseen kieliteoriaan**, joka yleisemminkin on **kriittisen tekstintutkimuksen lingvistinen perusta** (Kalliokoski 1996: 21). (Lingfin4)

‘In these chapters, **the analysis is primarily based on Halliday’s systemic-functional language theory**, which can be viewed as **the linguistic basis of critical text-linguistics** more generally (Kalliokoski 1996: 21).’

In these examples, the terms ‘theory’ and ‘hypothesis’ are used for scientific constructs of different scope. The expression *hypoteesini on, että* ‘my hypothesis is that’ in (12) introduces a specific claim concerning the use of the lexeme *vaikka*, i.e. that it has different uses that can be shown to be polysemous. In contrast, the expression *systeemifunktionaalinen kieliteoria* ‘systemic-functional language theory’ in (13) does not refer to an individual claim or assertion but is used of a systematic presentation of a phenomenon, in this case language. The role of scope in differentiating between ‘theory’ and ‘hypothesis’ is further illustrated in (14), where the assertions referred to as ‘hypotheses’ are derived from a larger construct referred to as a ‘theory’:

- (13) Isompia, **teorialähtöisiä hypoteeseja** voi testata vain useammista lähteistä peräisin olevilla aineistolla [...]. (Lingfin10)

‘Broader, **theory based hypotheses** can be tested only by data derived from several sources [...].’

This example reflects an epistemological position claiming that ‘theories’ need to be tested on empirical data (e.g. Hempel 1966, 70–84). Since these systematic presentations of phenomena are more often than not too broad to be directly tested, individual assertions and claims derived from these broader constructs are tested instead. The testing of a ‘hypothesis’ is thus always an act of testing the underlying ‘theory’ as well (e.g. Konstenius 2014, 121).

The formulation ‘broader hypotheses’ in (14) shows that even an individual assertion or claim may be discussed in relation to its size. As the scope of a scientific construct as such is not a categorical question, what is relevant to the choice of term is the scope of abstract scientific constructs *as conceptualized by the author*. In fact, Finnish linguists point out that the semantic potential of the terms ‘theory’ and ‘hypothesis’ is at least partly overlapping (Luodonpää-Manni 2013, 251). As we have seen, both are used to refer to scientific explanations that are not considered entirely certain. The differences between the two terms are therefore a matter of conceptualization of the respective scientific constructs. I suggest that the partial synonymy between the terms ‘theory’ and ‘hypothesis’ allows the author greater precision in expressing his or her attitude with respect for example to the perceived degree of certainty and stability as well as the scope of the scientific construct in question.

In their questionnaire answers, Finnish linguists similarly compared the terms ‘framework’ and ‘approach’ in relation to the scope of the scientific construct. According to the linguists, these terms are typically used for broader constructs than ‘theory’, and may include several ‘theories’ and/or ‘methods’ (Luodonpää-Manni 2013, 253). This aspect of the terms ‘framework’ and ‘approach’ is apparent in the research articles in my data as well:

- (14) Vygotskilainen lähestymistapa itsessään ei ole yhtenäinen oppirakennelma vaan **lähestymistapa, joka pitää sisällään monenlaista eri tutkijoiden edelleen kehittämää tutkimusta ja teoriaa**, joille on yhteistä sosiokulttuuristen tekijöiden huomioiminen yksilön kehityksessä ja sitä kautta myös kielenoppimisessa ja kielenkäytössä. (Lingfin50)



‘The Vygotskian approach is not a coherent scholarly structure as such, but **an approach consisting of many and diversified types of research and theory, developed by different researchers**. What they have in common is that they take sociocultural factors into account in individual development and thereby also in language learning and use.’

In (15), the scientific construct referred to as an ‘approach’ is conceptualized as a broader construct than those referred to as ‘theories’. This broader construct subsumes ‘theories’ and research developed by various researchers. In fact, it may be viewed as a field of study linked by certain shared principles, such as taking sociocultural factors into account in the development of the individual.

To sum up this discussion, the scope of the scientific constructs associated with the terms ‘theory’, ‘hypothesis’, and ‘framework’ / ‘approach’ can be schematized as follows: ‘framework’ / ‘approach’ > ‘theory’ > ‘hypothesis’. Generally accepted definitions of these terms in philosophy of science support this schematization and allow for adding the term ‘model’ to it. In the epistemological literature, ‘theory’ is often defined, following Kerlinger (1979, 64; see also Niiniluoto 1980), as a systematic presentation of phenomena. ‘Theoretical model’, in turn, is often defined, following the classic definition by Achinstein (1968, 230–231; see also Niiniluoto 1980), as a set of statements concerning a particular system (often referred to as a ‘theory’). Adopting this definition, the term ‘model’ applies to more narrow scientific constructs than ‘theory’. On the other hand, ‘model’, as a designation of “a set of statements”, is used in relation to broader constructs than ‘hypothesis’, which is usually defined as a claim or assertion formulated in such a way as to be testable (e.g. Silverman 2010, 109–110). The schematization may now be completed as follows: ‘framework’ / ‘approach’ > ‘theory’ > ‘model’ > ‘hypothesis’.

The actual use of these terms in practice, however, is not always that simple. First of all, in an actual research situation it is not always easy to decide whether one is dealing with “a systematic presentation of phenomena” or with “a set of statements” concerning this system. Second, these are not the only definitions given to these terms (see below). Third, the use of scientific terms does not depend solely on their epistemological definitions, but is also learned from their previous applications, leaving space for intuition (Kuhn 1994 [1962], 58–60; see also Konstenius 2014). The use of generic scientific terms is thus always conditioned by the conventions of research practice, which may vary from one scientific

domain or discipline to another. The role of research conventions is especially important in domains such as linguistics, where methodological training is at least partly a matter of learning from earlier research (Konstenius 2014, 14, 115, 188–189). The different research traditions underlying the methods adopted may be viewed as one source of the variation in the use of generic scientific terms in linguistic articles. As the purpose of this article is to provide a general description of choices between these terms, a detailed examination of the impact of different research traditions is left to future research.

### 4.3. Degree of abstraction

As we have seen, neither the degree of certainty and stability nor the scope of the scientific construct alone can adequately account for authors' choices between the terms 'theory' and 'model'. A number of the Finnish linguists who answered the questionnaire concerning generic scientific terms (Luodonpää-Manni 2013, 250), characterized the difference between 'theory' and 'model' in terms of the degree of abstraction of the scientific constructs these terms are typically used to refer to. Constructs referred to as 'models' were described as generally more illustrative, visual, and concrete than those referred to as 'theories', which were described as more abstract. This comes close to the definition of Carnap (1971, 54), according to which the conceptualization of 'model' as a scheme or simplification is related specifically to linguistic study. In the present material, the illustrative and visual character of a 'model' is present at least in the following examples:

- (15) Felberin teksti lähtee lähinnä klassisen **semanttisen kolmion mallin** pohjalta muodostetusta terminologian käsitelmästä (ks. kuvio 1) [...]. (Lingfin12)

'Felber's text is primarily based on the conceptual model of terminology formulated on the basis of the classic **model of the semantic triangle** (see figure 1) [...].'

- (16) Niin kutsutussa **kartiomallissa** esitetään ensin tapahtumaan liittyvät tärkeimmät tiedot, joiden valinta on subjektiivinen. (Lingfin53)

'In the so-called **cone model**, the most important information related to the event, whose choice is subjective, is presented first.'

In these examples, the scientific construct referred to as a ‘model’ involves a geometric representation of a phenomenon. In (16), the term ‘model’ is used for the well-known representation of the semantic triangle, further illustrated by a figure showing this geometrical form. (17) presents a second geometrical form, the cone. This visual representation is also referred to as a ‘model’. In fact, a distinction is sometimes made in the literature between ‘illustrative model’ and ‘theoretical model’ (Haaparanta & Niiniluoto 1986, 25–27), with ‘illustrative model’ referring to visual representations (see Section 4.3.) and ‘theoretical model’ to verbal explanations of phenomena. In experimental research, whose purpose is to test the validity of the scientific explanation of a phenomenon, the difference between ‘theories’ and ‘(theoretical) models’ is sometimes associated with the concept of operationalization. Large explanatory systems, often referred to by the term ‘theory’, are generally too abstract to be directly empirically tested or applied as such; thus they need to be operationalized in a form that can be measured or that can be used to explain the actual research material (see e.g. Konstenius 2014, 42). This operationalization may be called a ‘model’. In other areas of research, however, the distinction between ‘theory’ and ‘(theoretical) model’ is less clearly motivated, and the two terms may sometimes be considered as (partial) synonyms (see Section 4.5.).

The concrete nature of scientific constructs referred to as ‘models’ is further illustrated by the way this term is used in the material to designate an actual research technique:

- (17) Kyseessä on eräänlainen **laskentamalli**, jonka avulla tavoitellaan optimaalisia ratkaisuja. (Lingfin54)

‘It is a form of **calculation model** by means of which optimal solutions are sought.’

- (18) Irrallaan puhutut “neutraalipainotteiset” lauseet eivät sovellu tähän kovin hyvin, koska **tilastollinen malli** vaatii runsaasti näytteitä myös poikkeavista painotuksista. (Lingfin57)

‘Isolated sentences pronounced with a “neutral” stress are not very suitable here, since the **statistical model** requires abundant examples of atypical stresses as well.’

- (19) **Markovin piilomalli** (HMM) on **todennäköisyyksiin perustuva laskennallinen menetelmä**, jolla voidaan ennustaa alla olevan

prosessin kulkua siihen liittyvien näkyvien tunnusmerkkin avulla. (Lingfin11)

**‘The Hidden Markov Model (HMM) is a calculatory method, based on probabilities** that can be used to predict the progress of underlying process on the basis of the distinctive characteristics related to it.’

In these examples, the use of the term ‘model’ approaches the semantic field of ‘method’. In (18) and (19), ‘model’ designates the techniques used for calculation and statistical analyses. In (20), the Hidden Markov Model is explicitly referred to as a ‘method’ serving as a research technique. These examples show that in addition to the partial synonymy of ‘theory’ and ‘model’, the semantic potential of the terms ‘method’ and ‘model’ is partly overlapping as well. As a result, the term ‘model’ is highly polysemous in linguistics. In order to interpret the intended meaning of the term, readers rely on contextual clues and on their extralinguistic knowledge concerning the scientific constructs referred to by the term. As the readers of research articles are generally specialists in that domain, the polysemy of ‘model’ is not likely to cause serious misunderstanding.

If the semantic potential of ‘model’ overlaps in part with that of ‘theory’ and ‘method’, we may also ask about the relationship between the terms ‘theory’ and ‘method’. In their questionnaire answers, Finnish linguists stated unanimously that ‘method’ designates the actual, concrete means or tools used to investigate a phenomenon (Luodonpää-Manni 2013, 253). ‘Theory’ and ‘method’, however, are bound together; ‘method’ is characterized as a means to test the scientific construct referred to as a ‘theory’ or to apply it in the research (ibid.). In other words, the difference between the semantic fields of ‘theory’ and ‘method’ is analogous to the dichotomy between the French concepts of *savoir* ‘know’ and *savoir-faire* ‘know-how’. While the domain of ‘theory’ consists of scientific knowledge, that of ‘method’ belongs to the field of scientific know-how. Scientific *savoir* and *savoir-faire* are obviously in a reciprocal relationship: scientific knowledge inevitably affects conceptions concerning the relevance of particular research techniques, while research techniques may be used to test the validity of a particular scientific explanation.

Despite the fairly unproblematic description of ‘method’ by Finnish linguists, the analysis of the authentic material shows that the difference between scientific constructs offering information concerning a particular phenomenon and those providing analytical tools for obtaining new

information about the phenomenon is not always very clear. The constructs we find in (21) and (22) share characteristics of both types:

- (20) Käyttämäni **Greimasin (1980) aktanttimalli** on tarkoitettu ensisijaisesti kertovien tekstien analysointiin. (Lingfin6)

‘**The actantial model of Greimas** applied here is primarily designed for the analysis of narrative texts.’

- (21) Yksi paljon käytetty analyysimalli on **Norman Faircloughin (esim. 1992) kehittämä intertekstuaalisen analyysin malli**. (Lingfin9)

‘One model of analysis which is often applied is **the model of intertextual analysis developed by Norman Fairclough** (e.g. 1992).’

In these examples, scientific constructs associated with the names of Greimas and Fairclough are described as ‘models’ providing the tools for text analysis. However, these constructs also include plenty of basic information and assumptions concerning narrative texts and intertextuality in general. As pointed out in one of the questionnaire answers, some linguistic ‘models’ contain characteristics of both ‘theories’ and ‘methods’ (Luodonpää-Manni 2013, 254). Some of these constructs indeed contain scientific claims concerning a phenomenon and methodological suggestions for investigating it. I suggest that in this case the use of the term ‘model’ is functional: being used to refer both to a scientific explanation and to research techniques, it allows the researcher space to deal with both aspects of the scientific construct in question.

It is worth noting that even though Finnish linguists unanimously define ‘method’ as the concrete means or tool used to investigate a phenomenon, the analysis of the authentic material shows that ‘method’ is also used for systematic procedures adopted in collecting the research material:

- (22) **Aineistonkeruumenetelmänä** on ollut **teemahaastattelu**, joka soveltuu käytettäväksi erityisesti silloin, kun halutaan kuvata kulttuurisesti hyväksytyjä käsityksiä sosiaalisesta todellisuudesta, ei niinkään haastateltavia henkilöinä (Sulkunen 1987: 48, 50). (Lingfin5)

**‘The method for collecting the material was a thematic interview**, which is a technique applicable especially in describing culturally accepted conceptions of social reality, less so the interviewees as individuals (Sulkunen 1987: 48, 50).’

- (23) tietokonepohjainen **ScriptLog-aineistonkeruumenetelmällä** tuotettu kirjoitustesti (Lingfin11)

‘a computer-mediated writing test produced by the **ScriptLog data-collection method**’

In these examples, ‘method’ is used to refer to established procedures of data collection, namely thematic interviewing (23) and the ScriptLog computer-mediated writing test (24). To facilitate the interpretation of the intended sense of ‘method’, the authors use the nominal compound *aineistonkeruumenetelmä* ‘method for collecting material’ to designate the collection procedure and to distinguish it from the procedure adopted in the actual analysis of the material. The articles in the present material, however, do not distinguish systematically between ‘research method’ and ‘data-collection method’. As this distinction is functional and helps to improve the methodological transparency of research, I suggest that the distinction between the two terms could be exploited more in linguistic articles. After all, Finnish has the nominal compound *analyysimenetelmä* ‘method of analysis’, which restricts the scope of method in a similar way as *aineistonkeruumenetelmä* ‘method for collecting material’.

#### 4.4. Definition of scientific constructs in broader terms

According to suggestions by Finnish linguists, the use of certain generic scientific terms, such as ‘framework’ or ‘approach’, may arise out of the desire to formulate one’s position in broader terms than the term ‘theory’ would allow (Luodonpää-Manni 2013, 253). However, it is not clear what is meant by ‘broader terms’. On the basis of the authentic material, this expression can be understood in at least two ways. The first interpretation is related to the philosophical connotations of these terms. Especially the terms ‘theory’, ‘hypothesis’, ‘model’, and ‘method’ have been subject to ample discussion in the methodological and philosophical literature. Since this discussion has traditionally revolved around an experimental or other empirical context, a researcher whose aim is not to test the validity of scientific constructs might find these terms too

restrictive. The terms ‘framework’ and ‘approach’, which are less historically burdened, allow the researcher to avoid certain epistemological engagements.

An example of the impact of epistemological conceptions in the naming of scientific constructs is offered by the discussion concerning the status of conversation analysis. According to Etelämäki et al. (2009, 163), conversation analysis is generally not viewed as a ‘theory’ of language but as a research ‘method’ for the study of social practices. According to the researchers, ‘theory’ is understood as a scientific explanation consisting of falsifiable claims. The researchers (ibid. 167) admit, however, that conversation analysis involves certain fundamental suppositions concerning the nature of language as an instrument of social action (see also Peräkylä 2005, 875). If ‘theory’ is understood as the abstract foundation of a study (see e.g. Creswell 2014, 64), these basic assumptions might be characterized as the ‘theory’ of conversation analysis. The reluctance to use the term ‘theory’ in connection with conversation analysis may also be influenced by the everyday meaning of ‘theory’, as opposed to practice. For example, Peräkylä (2005, 875) seems to consider ‘theory’ as opposed to empirical research: researchers engaged in conversation analysis are practicing the empirical study of communication in authentic language use situations, rather than theoretical research.

The debate over the status of conversation analysis illustrates the fact that conceptualization and naming are closely related phenomena: the conceptualization of a scientific construct, such as conversation analysis, determines how it will be referred to. Differences in the conceptualization of these constructs may lead to terminological differences in the naming of the same scientific construct. In the following examples from the material, the authors use the terms ‘(theoretical) framework’ (25, 27) and ‘approach’ (26) in referring to conversation analysis:

- (24) Yksi runsaasti keskustelua herättänyt kysymys on, mitä tarjottavaa **keskusteluanalyttisellä viitekehyksellä** voisi olla kielen oppimisen tutkimukselle (Firth & Wagner 1997; Brouwer 2003; Brouwer & Wagner 2004; He 2004; Mondada & Pekarek Doehler 2004; Seedhouse 2005; Markee 2000, 2005). (Lingfin8)

‘A question that has been subject to extensive discussion is what **a conversation-analysis framework** has to offer the study of language learning (Firth & Wagner 1997; Brouwer 2003; Brouwer & Wagner 2004; He 2004; Mondada & Pekarek Doehler 2004; Seedhouse 2005; Markee 2000, 2005).’

- (25) **Lähestymistapani on keskusteluanalyttinen** (ks. esim. Tainio 1997a). (Lingfin24)

‘**My approach is based on conversation analysis** (see for ex. Tainio 1997a).’

- (26) **Tutkimuksen teoreettis-metodologinen viitekehys on keskusteluanalyysi** [...]. (Lingfin31)

‘**The theoretical and methodological framework of the study is one of conversation analysis** [...].’

In the light of the above discussion on the naming of conversation analysis, these terms may be used for conversation analysis to formulate one’s position in broader terms. Choosing the term ‘(theoretical) framework’ or ‘approach’ as a name for conversation analysis, the authors avoid taking an explicit stand on the status of this scientific construct. One author (27), however, recognizes the difficulties concerning the theoretical and methodological status of conversation analysis and qualifies it with both of these adjectives. This characterization allows showing both of these aspects related to the scientific construct in question.

The second interpretation concerning the meaning of ‘broader terms’ in the questionnaire answers is that these terms would be chosen to express the idea that the scientific constructs applied to the research combine ideas of several theoretical and methodological constructs. Finnish linguistics has traditionally been characterized by its eclectic nature: instead of strict theoretical engagement, Finnish linguistic studies typically combine ideas from different sources. In practice, scientific constructs called ‘theories’ are not necessarily adopted and applied directly in the research articles but theoretical ideas from different sources are combined and introduced more indirectly through reference markings. In those cases, using ‘broader terms’, such as ‘(theoretical) framework’ or ‘approach’, allows the researcher to formulate the eclectic nature of the study:

- (27) Tämän artikkelin **teoreettinen ja metodinen viitekehys** rakentuu lähinnä retoriikasta sekä osin diskurssianalyysistä. (Lingfin19)

‘**The theoretical and methodological framework** of this article consists primarily of rhetoric, to some extent also of discourse analysis.’



In this example, the ‘theoretical and methodological framework’ of the study consists of more than one theoretical and methodological tool, primarily rhetoric and secondarily discourse analysis. The terms ‘theory’ and ‘method’ are not ideal for reflecting the diversity of certain scientific constructs, such as discourse analysis (28) or conversation analysis (above), both of which comprise various theoretical and methodological elements; therefore ‘broader terms’, such as ‘approach’ or ‘(theoretical) framework’, may be chosen to indicate this diversity. In fact, (29) shows that, in order to be referred to as a ‘theory’, the scientific construct needs to be relatively coherent:

(28) Vygotski ei itse varsinaisesti ehtinyt kehittää **yhtenäistä teoriaa tai oppirakennelmaa**. (Lingfin50)

‘Vygotsky himself did not have the time to develop **a coherent theory or systematic ideational structure**.’

These scientific constructs are not considered as ‘theories’ because they are not coherent systems. It is, however, worth noting that constructs which from the outside appear relatively coherent often turn out to be more heterogeneous in the eyes of researchers specializing in the subject. In this case, the use of ‘broader’ terms, such as ‘approach’, ‘(theoretical) framework’, ‘point of view’, and ‘orientation’, allows the researcher to express the idea that he/she shares the fundamental principles of the scientific construct but does not necessarily engage in all its developments. Given the multiplicity of perspectives in linguistics, it is important for the researcher to identify with a specific research community, sharing a number of fundamental theoretical or methodological principles. The choice of ‘broader terms’ may therefore be seen as functional. These terms enable the precise expression of the researcher’s specific adherence to the scientific constructs referred to in the study.

#### 4.5. Questions of style and convention

According to Geeraerts (1988), studies in the field of cognitive linguistics often aim at explaining all variation in word use by differences in their conceptualization. This attitude arises from the Langackerian proposition that a difference in linguistic form always corresponds to a difference in meaning. According to Geeraerts (*ibid.*; see also Päiviö 2007), the choice of a synonym is not always the result of differences in the conceptualization. The synonymous use of two terms may be due to

stylistic factors, especially in the quest to avoid unnecessary repetition. In my material, two terms are sometimes used to designate similar scientific constructs in a single research article:

- (29) Joidenkin koulutekstienkin tarkastelu olisi myös helppo integroida **argumentaatioteorioihin**, esimerkiksi **Perelmanin ja Toulminin malleihin**. (Lingfin56)

‘The analysis of some school texts could easily be integrated into **argumentation theories**, such as **the models of Perelman and Toulmin**.’

In (30), the author refers to scientific constructs elaborated by Perelman and Toulmin as examples of argumentation ‘theories’, but in the same sentence also refers to them as ‘models’. The terminological variation in this example is probably motivated by their frequent repetition in the same sentence; changing the terms allows the author to vary his or her expression. In fact, the terms ‘theory’ and ‘model’ are likely candidates for close synonyms in at least some of their uses. Erätuuli, Leino, and Yli-Luoma (1996, 29) conclude that it seems to be a question of taste whether a writer refers to an object closely related to the foundation of his/her work as a ‘model’ or a ‘theory’. This claim is consistent with the observations of Finnish linguists, who in their questionnaire answers noted that the difference between the terms ‘theory’ and ‘model’ is not clear in linguistics (Luodonpää-Manni 2013, 250). It should be noted, however, that it would not be very natural to switch the order of the two terms in (30) into ‘argumentation *models*, such as the *theories* of Perelman and Toulmin’. The reason for this is that scientific constructs named ‘argumentation theories’ are presented in (30) as an upper-level concept, examples of which include the constructs named ‘models of Perelman and Toulmin’. As shown in Section 4.2., the term ‘theory’ typically applies to larger scientific constructs than ‘model’.

Another factor that cannot be ignored in the choice between generic scientific terms is related to the prestige of a term as experienced by the writer. This factor, however, is not easy to identify in the authentic material. Instead, the linguists who filled out the questionnaire pointed out that ‘model’ is ‘fashionable’ at the moment (Luodonpää-Manni 2013, 250), while some fields of linguistic research prefer to avoid the term ‘theory’ (see Section 4.4.). They also suggested that certain terms are misplaced in academic discourse. Even though all the terms discussed in this paper have been collected from articles published in peer-reviewed

scientific journals, the researchers consider that the terms ‘point of view’, ‘orientation’, ‘(theoretical) framework’, and ‘starting point’ are ambiguous and ill-defined (ibid., 257). In particular ‘point of view’ and ‘starting point’ are described as subjective and colloquial. Yet, these terms are not rare in the material (see Table 3.1); indeed, as we saw in Section 4.4., some of these terms play an important role in the expression of the theoretical perspective adopted in the research.

It should likewise be kept in mind that sometimes the choice between (partial) synonyms is due to the conventionalization of a name to designate a particular scientific construct. We normally talk about the *theory of evolution*, not about the *hypothesis of evolution*, unless we want to explicitly question the degree of certainty of this scientific construct. When a particular name is conventionalized to designate a given scientific construct, the author is not free to choose the term he/she uses to refer to that construct. In such a case, the term appears in an expression that resembles a proper name attached to the scientific construct. These names are most often attached to well-established scientific constructs, such as prototype theory or Speech Act Theory.

## 5. Discussion

In this article, the choice between generic scientific terms has been discussed primarily from the perspective of semasiological salience, which is determined in relation to characteristics that an entity needs to have in order to be considered a typical representative of the category. Since writers’ conceptions as to the scientific constructs these terms are typically used to refer to cannot be accessed directly from texts representing authentic use of these terms, a sequential strategy was adopted. This type of mixed methods approach combines independent material from a previously completed questionnaire study (Luodonpää-Manni 2013) with the analysis of authentic research articles.

In order to account for the choice between generic scientific terms, they have been considered in relation to their adjacent terms. It has been noted that the semantic potentials of these terms are partly overlapping, but that each one has its own semantic specificities that guide the choice of term. The terms diverge at least in the typical functions and qualities assigned to them in research articles. The term ‘theory’ is generally used for systematic presentations of phenomena that are considered to be relatively well-established and that function as the abstract foundation of the study. ‘Hypothesis’ is typically used to refer to individual claims, characterized by a low degree of certainty. The validity of these claims is

often tested in the research. The term 'model' also has its own semantic potential, consisting of a relatively concrete representation of a phenomenon, possibly in visual form. In addition, the concrete nature of the entities designated by this term can be seen in the way it is sometimes used for research techniques applied in the study. In this function, 'model' approaches the semantic space of 'method'. However, while 'method' is also used for procedures related to collecting the material, the use of 'model' in reference to a research technique is limited to the tools used in the actual analysis of the material.

In addition to semasiological salience, the choice between terms is influenced by their onomasiological salience, derived from the degree of conventionalization of the term for the category. In some cases, a particular term is conventionally used as part of a name for a particular scientific construct, approaching the status of a proper name for that entity. In such a case, an author cannot choose to use another term for the construct without ending up with a stylistically marked expression. On the other hand, the choice between the terms may sometimes be explained by stylistic motives, especially by the desire to avoid undue repetition.

Thus, the factors mentioned by Finnish linguists in their questionnaire answers proved to be useful in explaining the naming of scientific constructs in the authentic material as well. The results suggest that, both in conscious consideration by scholars and in the actual use of these terms, the factors that affect the choice of a term to designate a scientific construct are essentially the same. The fact that similar results were arrived at by two different methods reinforces the validity of the findings (see e.g. Flick 2004, 183; Konstenius 2014, 66). More importantly, the two methods supplement the results gained by each one and allow a more profound understanding of the phenomenon.

The questionnaire answers offered information on researchers' conceptions that could not have been obtained from the actual use of the terms. In particular, the conscious motivations behind terminological choices, and the prestige attached to different terms, could not have been identified without asking the researchers directly. On the other hand, researchers' conscious conceptions do not necessarily coincide with their actual use of the terms. The analysis of the research article material showed that, on top of the factors elaborated in the questionnaire answers, the naming of scientific constructs is also influenced by certain stylistic and epistemological questions, as well as by conventional naming practices. Despite the unanimous definition of 'method' by Finnish linguists, the actual use of the term is less straightforward. The term is used for at least two different aspects of linguistic research: collecting the material and

analyzing the data. I suggest that a systematic terminological distinction between ‘research methods’ and ‘methods of data collection’ would enable researchers to improve the precision and transparency of their work.

The sequential strategy of course has its limitations. Questions asked in the questionnaire, whereby linguists were invited to compare eleven other terms to ‘theory’, restricted the possible responses to this type of question (see Appendices 1 and 2). However, asking the participants to compare generic scientific terms removed the risk that the respondents might merely cite the definitions of these terms as learned during their methodological training. The study would also have benefited from a higher number of participants. Despite these drawbacks, however, the sequential strategy adopted shows the advantage of using researchers’ own views as a basis for the choice of factors assumed to affect the choice among generic scientific terms.

From the methodological point of view, the approach implemented here would seem to be relevant to other semantic studies as well. Especially in studies that aspire to disentangle speakers’ conceptions regarding lexemes belonging to the same semantic field, the sequential strategy, combining a questionnaire and the analysis of authentic material, provides information that would otherwise go unrecognized. These two independent methods supplement the information that can be gained by either one alone. Combining information collected from native informants and corpora representing authentic language use has the capacity to lead to a more profound understanding of the phenomenon. This approach avoids the trap whereby a semantic analysis diverges too much from native-speaker intuition, at the same time allowing full utilization of professional analytical expertise.

The study has also demonstrated the possibilities offered in semantic analysis by the contrastive method. The semantic specificities of the various terms could not have been identified in isolation from adjacent terms without losing some essential information. The comparison between adjacent terms allowed for the unique semantic potential of each term to be taken into account, as well as the relationships among the different terms. I suggest, in agreement with Victorri and Venant (2007, 84), that in order to describe the semantic specificities of a given lexeme, typically polysemous in itself, a consideration of its global network of synonymic relations is essential.

## 6. Conclusion

The purpose of this article was to examine writers' choices among generic scientific terms in linguistic research articles written in Finnish. Particular attention was paid to the terms 'theory', 'hypothesis', 'model', and 'method'. The results suggest that the factors contributing to the choice of a term consist of perceived scope and coherence, the degree of certainty and stability, and the abstraction of the scientific construct. For example, the term 'theory' is generally attributed to larger, more coherent and more established constructs than the terms 'model' and 'hypothesis'. On the other hand, 'model' is often used for scientific constructs of a more illustrative and concrete nature than 'theory', sometimes approaching the semantic space of 'method'. However, as the extent, coherence, degree of certainty, and abstraction of a scientific construct are all relative concepts, the designation of these entities ultimately depends on their conceptualization. The partly overlapping semantic potential of these terms may in fact be seen as functional, allowing the authors to express subtle conceptual specifications concerning particular scientific constructs.

In addition to the factors mentioned by the linguists in their questionnaire responses, the naming of scientific constructs was also found to be influenced by stylistic and epistemological factors and by the conventional naming of scientific constructs. Where a certain name has been conventionalized in reference to a particular scientific construct, the author cannot really choose between terms without making a specific statement concerning for example the plausibility of the construct. Another case where the choice among terms is not due to conceptual factors is that where the author chooses another term to designate a particular scientific construct for stylistic reasons, to avoid undue repetition. The use of the terms was also found to be influenced by epistemological matters. Although researchers rarely comment on epistemological issues in their articles, the use of generic scientific terms nevertheless seems to vary according to different research traditions. Further metatheoretical consideration is thus needed in the field of linguistics.

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## Notes

<sup>i</sup> This article is based on a doctoral dissertation concerning the use of generic scientific terms in French and Finnish research articles (Luodonpää-Manni, 2016).

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<sup>ii</sup> The dictionary of contemporary Finnish Kielitoimiston sanakirja (2016) presents *metodi* and *menetelmä* as synonyms:

*Menetelmä*: järjestelmällinen, suunnitelmallinen menettelytapa,  
metodi 'systematic, methodical procedure, method [metodi]'

*Metodi*: järjestelmällinen, suunnitelmallinen menettelytapa,  
menetelmä 'systematic, methodical procedure, a method [menetelmä]'

In the dictionary, *hypoteesi* and *oletus* are also defined using similar expressions:

*Hypoteesi*: oletus, otaksuma 'supposition, assumption'

*Oletus*: olettamus 'an assumption'

Although *hypoteesi* and *oletus* are probably not exact synonyms, in scientific discourse they are often used in similar functions, confirming that their semantic potential is at least partially overlapping.

<sup>iii</sup> In the methodological literature, research combining multiple methods has been referred to by various terms, including *multimethod research*, *mixed methods research*, *the mixed methods approach* and *methodological triangulation* (Brewer & Hunter 1989; Creswell & Plano Clark 2007; Creswell 2014; Morse 1991). Such an approach has often involved combining qualitative and quantitative methods in a single study (e.g. Creswell & Plano Clark 2007, 6), but the inclusion of different qualitative (or quantitative) methods alone is possible as well (Creswell 2014, 228). That is the case in the present study.

<sup>iv</sup> The abbreviation Lingfin refers to the corpus of linguistic research articles written in Finnish. The number after this abbreviation identifies the individual article in this corpus.

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## Appendices (A-B)

### A. Original questionnaire

Oheisen kyselylomakkeen tarkoituksena on kerätä tietoa tieteellisten käsitteiden käytöstä. Lomake on lähetetty tutkijakoulu Langnetin piirissä toimiville jatko-opiskelijoille ja ohjaajille sähköpostilistan kautta tutkijakoulun suostumuksella. Kerättäviä tietoja käytetään ainoastaan tieteellisiä käsitteitä koskevan väitöstutkimuksen osa-aineistona ja vastauslomakkeet hävitetään väitöskirjan tarkastuksen jälkeen. Lisäksi tutkittavien nimi- ja yhteystiedot hävitetään, kun lomakkeet on kerätty ja vastaamatta jääneitä on kertaalleen muistutettu mahdollisuudesta vastata lomakkeeseen. Jokainen vastaus on erittäin tärkeä. Toivon, että lähettäisit lomakkeen sähköpostitse täytettynä 23.10.2009 mennessä.

Yhteystiedot: Milla Luodonpää-Manni, mikalu@utu.fi  
Tohtorikoulutettava (ranskan kieli, Turun yliopisto)

#### Mitä eroa on mielestäsi seuraavilla sanoilla:

teoria ja metodi

teoria ja hypoteesi

teoria ja malli

teoria ja teesi

teoria ja viitekehys

teoria ja lähestymistapa

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teoria ja näkökulma

teoria ja suuntaus

teoria ja kuvaustapa

teoria ja lähtökohta

teoria ja tutkimusmenetelmä

## **B. Translation of the questionnaire**

### **Background of the questionnaire**

**The purpose of the questionnaire is to study the use of scientific terms. The questionnaire has been sent to doctoral candidates and their supervisors working within the Langnet doctoral program, using the Langnet mailing list with the permission of the program. The responses will be used only as part of my thesis; after the thesis defense, the forms will be destroyed. In addition, the participants' personal information will be removed once the responses have been collected and non-responding participants have been reminded of the possibility of answering the questionnaire. Each response is very important. I hope you can send the filled-in form by e-mail by October 23rd 2009.**

Contact: Milla Luodonpää-Manni, mikalu@utu.fi  
Doctoral student (French language, University of Turku)

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**In your opinion, what is the difference between the following terms?**

theory and method

theory and hypothesis

theory and model

theory and thesis

theory and (theoretical) framework

theory and approach

theory and point of view

theory and orientation

theory and manner of examination

theory and starting point

theory and method [menetelmä]