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Löhndorf, Simone

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SIMONE LÖHNDORF
CENTRE FOR LANGUAGES AND LITERATURE | LUND UNIVERSITY

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Simone Löhndorf

LUND UNIVERSITY

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Abstract

This thesis is about the development of adjective use and meaning structures examined from a cognitive linguistic perspective. Adjectives modify nominal meanings and it is in context, in the interaction with the noun that the adjective meaning and configuration is determined. Nearly 13,000 adjective-noun combinations from texts written by Swedish students in grades 3, 5, 9, and 11/12 were analysed according to the LOC model (Ontologies and Construals in Lexical Semantics, Paradis, 2005) with regard to domains, noun ontology, adjective gradability, adjective position, and adjective function. Furthermore, the use of figurative language was studied. The results show a development from adjectives predominantly modifying concrete nouns to increasingly abstract meanings from a broad range of adjective and noun domains. The younger students use adjectives predominantly in the predicative position but there is a gradual shift towards attributive use, and attributive uses are the most common in the highest grade. Adjectives are primarily used in a descriptive function, but in the highest grade approximately one third of all adjectives are used in a classifying function. Scalar adjective construal is the most common in all grades, but the proportion of scalar uses decreases in favour of an increase in non-gradable uses. Figurative language is rare in all grades, but there is an increase in metaphorical language over the school years.

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Development of Adjectival Use and Meaning Structures in Swedish Students' Written Production

Simone Löhndorf

LUND
UNIVERSITY

*For Mattias who taught me both how significant
and insignificant language is.*

*And for Benjamin, Leonard and Julian
who bring me joy every day.*

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Acknowledgements

1 Introduction

The purpose of this thesis is to provide insights into conceptual development during the school years. This development is observed through the lens of lexical development, more specifically by examining the use of adjective and noun combinations in narrative and expository texts written by native Swedish speakers in Grades 3, 5, 9, and 11/12. While there exists a large body of research on early language acquisition and development, the conceptual development during the school years, especially the later ones, is still largely unexplored. Furthermore, semantic development is not extensively studied in any age group and adjective meanings especially are an understudied category. The unique contribution of this thesis is its multifaceted examination of adjective use during the school years, offering observations on conceptual development in older children and adolescents. The results may provide valuable insights to several other fields in addition to language development study, such as cognitive psychology, cognitive science, education, and speech language pathology.

The study of later language development differs from the study of early language acquisition. Just like early language acquisition, later language development is a continuous process; however, advancement is more often about refinement than about the acquisition of completely new meanings. Growth and changes are subtle and can therefore be difficult to discover. These subtle changes are most readily captured when students are asked to perform cognitively and linguistically demanding communicative tasks. Written narratives and expository and persuasive discourse have proven to be particularly suited as means of investigation (Nippold 2003; Nippold et al., 2003; Ravid 2004).

1.1 Starting points

In accordance with the framework of Cognitive Linguistics, my approach to adjectival meaning has a conceptual integration perspective, which means that adjectives obtain their meanings when combining with the meanings of the nouns they modify (Paradis, 2005). According to the conceptual integration approach, every reading of a word adds

up to a word's total use potential in the mind of the individual language user. The theory of conceptual integration and how the encountering of different readings builds up a word's use potential in the mind of the language user is central to this thesis – it might even be fair to say that it is the key motivation for performing a developmental study.

Any theory of language development would acknowledge that children's vocabulary grows in parallel with the individual child's cognitive development and in proportion to both passive and active language use. Especially during the school years, after learning to read, not only the number of new words continues to increase, but they are also drawn from a wider and more diverse range of domains. However, in keeping with Cognitive Linguistic theory and the conceptual integration view, not only does the vocabulary, i.e., the number of word forms, increase with age and experience, but each word's use potential also expands in the developing mind. Evidently, this is not only the case for adjectives integrating with nouns, but for words in general – their meanings and use potentials change and develop with every different contextual encounter. While we can assume that this process is most obvious in young language users, it is open-ended; as long as a person uses and is confronted with language, whether spoken or written, word meanings are susceptible to change. In this study, adjective and noun combinations are chosen as the means to explore this process, since the adjectival modification of the noun and the conceptual changes that both nouns and adjectives undergo when their meanings are combined, serve as a feature to demonstrate how word meanings change and expand in context. Significant aspects of meaning changes and expansions are the uses of increasingly abstract meanings, as well as the use of what is traditionally referred to as figurative language. This flexibility in language use may furthermore lead to a manipulation of adjective gradeability, where the configuration is susceptible to change.

In addition to the change of meaning, speakers use adjectives in different functions. Besides specification (description) and kind identification (classification), speakers can express different communicative needs by means of element identification, identity provision, and stipulation. The adjective position being either attributive or predicative is partly determined by which function it serves. Kind identification, element identification, and stipulation restrict the adjective to the attributive position, whereas it is the language user's choice when the adjective serves to specify or provide identity.

1.2 Aim and research questions

As mentioned above, the overall aim is to investigate conceptual development during the school years. The scope is the study of adjective and noun combinations in written essay production. The language use of adjective and noun combinations will be studied from both a semasiological and a functional perspective. Semasiologically, the focus is on conceptual development and the functional focus is on how adjectival and nominal meanings are used interactively in discourse.

In order to shed light on the aspects above and how they change with age, I concentrate on the following research questions:

- What types of adjectives do students use?

- In what configurations are the adjectives construed?

- What types of nouns do the adjectives modify?

- In what functions are the adjectives used?

- In what constructions are the adjectives used (predicative/attributive)?

- When do students start expressing figurative meanings?

On the semasiological/cognitive level, the use of adjectives will be studied with regard to domains, i.e., which types of adjectival meanings students express at different ages. Furthermore, the configurational structure of these meanings at the time of use will be analysed, i.e., whether the configuration is gradable, non-scalar, or non-gradable. The development of nominal meanings will be studied with respect to concreteness and abstractness and concrete meanings will additionally be analysed with regard to domain. Lastly, each adjective and noun combination will be considered with regard to being used in a basic, metaphorical, or metonymical sense. On the interactional level, the function of the adjective will be analysed, i.e., whether the adjective is used to specify, classify, identify, stipulate, or provide identity. Moreover, the adjective construction, i.e., the adjective position being attributive or predicative, will be part of the analyses. A number of quantitative aspects of the students' essays will be calculated and analysed to provide some general background measures, such as text length, lexical diversity and number of adjectives. These measures make the data in this study comparable to other studies using students' essays as material.

I expect all of the aspects mentioned above to change with age. While some production measures will be presented and discussed, my focus will be on the semasiological and

functional aspects. Semasiologically, I expect older students to express meanings from a wider range of domains and from increasingly abstract domains. Moreover, I expect adjective configuration to be mostly gradable in the younger age groups and the older age groups to have more non-scalar and non-gradable uses. Figurative language is also expected to increase with age. On the functional level I expect that older students will make use of a wider range of functions than younger students. Furthermore, I expect adjective construction to be affected by both semasiological and functional elements.

1.3 Roadmap of the thesis

The thesis has 14 chapters, including this introductory chapter. Chapters 2 to 8 address the theoretical dimensions of the research. Chapters 2 to 7 discuss relevant aspects of the cognitive linguistic framework, chapter 8 lays out the foundations of conceptual and language development. Chapter 9 concerns the empirical study and comprises the methodological part of the thesis. In chapters 10 to 13 the analyses and results of the study are presented and discussed. Finally, chapter 14 draws on the entire thesis with a brief summary and concluding remarks. A note to the reader: In this thesis, I follow the convention of italicizing *words* and writing CONCEPTS in small capital letters. The school children and adolescents are called students and the different groups are named after the grade they attend, i.e., Grades 3, 5, 9, and 11/12. The students are aged 8–9, 10–11, 15–16, and 17–19 years, respectively. To ease the reading of this thesis, I use a number of shortcuts. *Adjective* and *adjectival meaning*, and *noun* and *nominal meaning* are convenient ways of saying 'meanings that are construed as adjectives' and meanings that are construed as nouns'. In a similar vein, I use the expression *abstract concept*, instead of writing 'lexical meanings that refer to abstract concepts'.

2 The study of meaning

This thesis is concerned with concepts and the study of meaning from a developmental perspective. But what exactly are concepts? How are they represented in the mind? And how are these representations mapped to word meanings referring to concrete entities in the world and abstract entities in our minds? These are among the most fundamental and most challenging questions within linguistics. Insight into these questions is the key to understanding the relation between language and thought (Croft & Cruse, 2004; Gärdenfors, 2000; Paradis, 2005; Talmy, 2000). The theories presented in the subsections of the theoretical background all make fruitful contributions to this field, they help further theory building, and offer insights into what empirical studies we need to do to gain further understanding of how meaning is created.

2.1 Words and concepts

There are as yet no research results that can provide a clear pattern on which to build a model of exactly how the mapping between concepts and words work and their relationship with the world. A notion in which every concept is connected in a one-to-one relationship to a word can easily be dismissed, among other reasons because there are many concepts without a word directly corresponding to them (Murphy, 2002). One example that Murphy cites is ELBONICS: The actions of two people manoeuvring for one armrest in a movie theatre or an aeroplane seat ─ a concept which probably most people recognize without having had a word for it. While content words by nature are connected to a concept, that is not the case the other way around (as illustrated by the ELBONICS example). Furthermore, the same word form can have several distinctly different meanings (either related or unrelated) which is reason enough to disqualify any theory that presumes a stable one-to-one mapping between words and concepts.

In many linguistic theories it is a common assumption that concepts have stable core meanings. However, it has been difficult to define what content structures these core meanings would consist of. A 'classical' linguistic view has been that concepts are defined by features.

Typical schoolbook examples used to illustrate the semantic feature theory describes *man* as [+human] [+adult] [+male], while *girl* would have the features of [+human] [–adult] [–male]. This is a binary way of describing things, which does not leave any room for fuzzy cases or variations of meanings. One of the problems with this theory can be illustrated with another frequently cited example, namely, the concept of bachelor (Lakoff, 1987). The semantic features of bachelor are [+human] [+adult] [+male] [–married]. However, these features include all single men, or even all unmarried men. Often cited as someone fulfilling these criteria, but not really corresponding to the concept, is the pope. The stereotype of a bachelor in most people's minds does not correspond to all men that are unmarried, and probably least of all the pope. Typically, the concept of bachelor corresponds to a man not in a romantic relationship, (often) by choice, not necessarily caring a lot about his appearance or the orderliness of his surroundings. The female equivalent, spinster, only differs from bachelor in the dimension of gender in feature theory, for example a spinster is [+human] [+adult] [–male] [–married]. Considering that these two concepts differ only in one dimension, one would expect that they would carry similar connotations. A spinster, however, is often associated with an elderly woman, living by herself involuntarily and overly caring about neatness. Moreover, a spinster is often thought of as a lonely, restricted woman, while a bachelor is a man free to do as he likes, spending the evening at the pub with his friends, not alone knitting in front of the TV. It would, of course, be possible to add to the list of features in order to clarify the additional differences between bachelor and spinster, for example with [+voluntary single] and [+social life] for bachelor and [–voluntary single] and [–social life] for spinster. Evidently, these descriptions would still not be applicable to all bachelors and spinsters in the world, but merely to my own personal stereotypes of them. Expanding the set of features to obtain more specific descriptions of a concept could go on ad infinitum and make the system uneconomical and difficult to read. Thus, it seems, that one does not have to dig very deep to realize that the binary semantic feature theory is too limited to even come close to the information that a concept comprises on a psychological level. Furthermore, it does not account for abstract concepts.

Rosch (1973, 1975) suggested a different model based on prototypes, which could accommodate untypical cases of a concept (however, this theory likewise lacks an account of abstract concepts). In prototype theory, concepts have an essence, a core which consists of the most prototypical representation of a concept. For colours, for example, this means that the primary colours are prototypes for their hues, and that lighter and darker shades are still within the range of that colour, even if they are not the most prototypical. This theory allows for non-prototypical instances and even overlaps ─ when do we decide, for example when a light red is not red anymore but is

already pink? Or, considering different shapes of bowls, at what point would we consider the rim to be too low to be counted as a bowl, but would rather be counted as a plate? Or the rim too high to be considered a bowl, but would rather be looked at as a cup, or even a vase (cf. the experiment by Labov, 1973)? A question to be asked is evidently what this core essence of a prototype would consist of. Is it an idealized version of a concept, or possibly some kind of 'averaged' version, that is, a synthesis of all encountered exemplars? Or might it consist of individually encountered exemplars? There are recent theories, for example within embodied cognition, that suggest that all these aspects may be psychologically valid, but that each theory in itself is insufficient (Barsalou, 2017).

Embodied cognition argues that concepts evoke mental simulations of physical experiences. As human beings we engage with the world (both internal and external) via our senses and the different stimuli are communicated via different specialized neural pathways. The experience of a car, for example, is made up of a multitude of impressions, among others its shape, smell, and sound, and these sensory impressions are processed in different brain areas such as the visual cortex, olfactory cortex, and the auditory cortex. However, this information then gets immediately integrated in a multi-modal, neural, so-called convergence zone (Barsalou et al., 2003) creating a conceptual whole. Each experience with a car leaves a multi-sensory memory trace in the convergence zone and over repeated interactions with a car, a 'simulator', that is a schematic representation of the experience, will be created. Henceforth, this simulator will be activated and generate a partial re-enactment of the 'car-experience' each time the person thinks, speaks, or hears about CAR (Barsalou et al., 2003). This theory supports the cognitive linguistic assumption that meanings are evoked rather than fixed and stable. It also explains on a neurological level how meanings are subjective. Since the simulations that are evoked in relation to a concept are based on multi-sensory memory traces, they differ from person to person, since each person's memories are based on their individual and unique interactions involving that concept (e.g., CAR).

Considering the question of how communication may function if every person has her/his own embodied conceptual representation of entities, built on personal knowledge and experience, we can assume that, generally, the similarities outweigh the differences. Human language only extends to the human species, and most humans (I do however recognize that people with autism, for example, perceive sensory input differently and that this also affects communication) have highly similar bodies and brains, similar movement patterns, and perceive touch, smell, taste, and so on in similar ways. Furthermore, within the same culture, people are surrounded by the same or similar sources of information, educational systems, and media. All these similarities ought to lead to similar conceptual representations, albeit with personal variations

(Barsalou, 2017). Allowing for the personal experiences and individual variation of encyclopaedic knowledge people have, Langacker suggests that the activation of a particular specification is affected by centrality factors (Langacker, 1987a; Paradis, 2003, 2015). A specification's *conventionality*, *genericness*, *intrinsicness*, and *characteristics* are the factors that contribute to its centrality. *Conventionality* concerns how well established some knowledge is in the speech community, i.e., what is common knowledge, in contrast to personal knowledge. For example, the fact that Langacker's sister has sliced banana on her breakfast cereal is his personal knowledge, and while it does enrich his understanding of banana, it is not conventional knowledge. In conversation with other people, conventional knowledge contributes more to a specification's centrality than does personal knowledge. Secondly, *genericness* adds to a specification's centrality. The more generic a specification is, the more it adds to its centrality. For example, knowing that one's sister eats her cereal with sliced banana in the mornings is very specific knowledge, but being aware that cereal may be served with sliced banana is more generic. Thirdly, *intrinsicness* relates to a specification's degree of reference to intrinsic versus external properties. Shape, for example, is intrinsic to a higher degree than size. While size is relative to external referents (a banana is big or small in relation to other bananas), shape is object-internal. Finally, adding to a specification's centrality is its *characteristicness*. Characteristics is about uniqueness. If a specification can be identified solely by the expression, it is highly characteristic. Shape is generally more characteristic than colour — a pink banana, for example, would still be recognized as a banana on account of its shape. The four factors that make up a specification's centrality (i.e., conventionality, genericness, intrinsicness, and characteristicness) are separate and autonomous, but it is in their correlation that they make up a specification's centrality. In summary, although people's individual representations may vary to some degree, there are not only enough commonalities between human beings to understand each other, but we are also helped by the information a specification activates in a certain context, governed by its centrality factors.

2.1.1 Concrete and abstract concepts

Concrete concepts are usually described as phenomena that exist in time and space and that we can perceive with our senses. Artefacts and substances that we can see, touch, smell and taste are typical concrete concepts. A simplified definition of abstract concepts is that they are entities that are not associated with physical entities and therefore not spatially constrained. They are often defined relative to concrete concepts, i.e., they are negatively defined by not being concrete.

In Conceptual Metaphor Theory, Lakoff and Johnson (1980) argue that people use concrete concepts to represent abstract concepts metaphorically because abstract concepts are difficult to understand and represent. Conceptual Metaphor Theory is one of the more prominent embodied theories of abstract concepts. While it is debatable whether cross-domain mapping is possible for all kinds of abstract concepts, the theory's strength is that it does not rely on specific content to define abstract concepts, but instead proposes a mechanism for how abstract concepts may be expressed (Borghi et al., 2017). However, abstract concepts still need to have some intrinsic content and structure in order for such a mapping to be possible (Murphy, 1997). Metaphor theory will be discussed in more detail in section 7.1.

Concrete and abstract concepts differ in a number of ways. For example, abstract concepts show more variability between people and over time, and their meanings are influenced by personal, situational, and cultural context to a higher degree than concrete contexts (Barsalou, 1987). However, rather than representing a dichotomy, concrete and abstract concepts form a continuum of concepts from concrete to highly abstract (Lyons, 1977). In this thesis, this continuum is operationalized in terms of meanings existing in time and space (e.g., *cat*), called 1st order meanings, 2nd order meanings which are meanings existing in time (e.g., *fear*), and 3rd order meanings which are highly abstract meanings existing neither in time nor space (e.g., *idea*), as defined by the LOC (Language as Ontologies and Construals) model (Paradis, 2005).

There is still little understanding of the content structures of abstract concepts. In psycholinguistic experiments they are often studied with respect to memory (how well people can remember them) and lexical access (how quickly people can access them). More often than not, they have been studied in isolation — however, considering the variation of meaning from context to context, studying concepts in isolation is limited and possibly produces distorted results as a consequence (Barsalou et al., 2018). For example, in studies where single words have been studied, words denoting concrete concepts are processed much faster than abstract words, leading to the conclusion that concrete words are easier to recall/access – an effect called the concreteness effect. However, when Schwanenflugel and Stowe (1989) conducted two experiments comparing concrete and abstract words both without and with a meaningful context, the difference disappeared when they were put in context. There was no longer a time difference in the processing of concrete and abstract words.

No theory has yet been able to come up with a full or entirely satisfactory explanation for how abstract concepts are represented in the mind, or how abstract referents are grounded (considering that they do not have a perceptible referent). That said, Barsalou et al. (2018) recently presented an account of abstract concepts with several merits within the framework of grounded cognition and situated action. They suggest the

brain to be a 'Situation Processing Architecture' and hypothesize that it contains two kinds of neural systems, producing two kinds of essential concepts, namely, concepts that *represent* situational elements and concepts that *integrate* situational elements. The framework recognizes that even the most concrete concepts contain abstract elements or can be associated with abstract domains in certain contexts and vice versa. The concept of DINING, for example, is associated with both concrete elements (such as food and cutlery) and abstract elements (for example financial transaction). Concepts of EMOTION typically integrate concrete and abstract situational content. But also concepts usually categorized as entirely abstract, such as TRUTH are grounded in experience when they are used to refer to specific situations or experiences. The biggest theoretical difference of this approach compared to earlier ones is that the focus is not on concrete or abstract conceptual content, but instead on processing differences. The situated conceptualization framework suggests a distinction between *internal* and *external* elements of situations and further a distinction between situation *elements* and situation *integrations*. Examples of external situational elements are objects, agents, events, and environment, whereas internal situation elements consist of, for example, emotions, motivations, thoughts, and self-relevance. The variation of situational *integrations* is defined only by the number of possible combinations of situational elements (Barsalou et al., 2018).

Just as in other theories of concepts, language plays a central role especially with regard to meanings traditionally categorized as abstract, because it is an important way to point to those unbounded, non-physical, non-perceivable entities. While the situated conceptualization framework does not consider the concrete/abstract terminology very useful and instead suggests a distinction between internal, external, and integrated elements, language is just as crucial in order to refer to internal situational elements and to the internal integration of external and internal situational elements. However, language alone is not considered sufficient to create a full representation of a concept — they only become fully activated in a specific context where relevant internal and external situated elements are integrated (Barsalou et al., 2018).

The account above fits well with the Language as Ontologies and Construals framework (LOC, Paradis, 2005) used in this thesis. I will however keep the terminology of concrete/abstract. The LOC model and how different meaning structures (in particular adjectival and nominal meanings) are operationalized in this thesis is explained in the sections about ontologies, construals, nouns, and adjectives.

2.2 Ontologies and construals

The notions of ontologies and construals are central to the study performed in this thesis. Both adjective and noun meanings will be annotated with regard to both aspects, which are presented further in the chapters on nominal meanings (chapter 3) and adjectival meanings (chapter 4), respectively.

2.2.1 Ontologies

Traditionally, the notion of ontology has primarily been related to the fields of mathematics, computer science, and philosophy (Paradis, 2005), although in the past few decades it has become more often used in the field of linguistics (Schalley, 2019), partly because of its use in the development of Semantic Web technologies, for example the Princeton WordNet and the EuroWordNet (Paradis, 2005). However, ontological structuring has proven to be useful not only in those more technical fields, but also for structuring and analysing natural language data for other linguistic investigative endeavours.

The definition of ontology differs somewhat in different disciplines. In philosophy, for example, ontology is the study of things that exist in the world and their general features and relationships (Hofweber, 2016; Schalley, 2019). In the fields of Artificial Intelligence (Gruber, 1993), the field of Knowledge Representation (Sowa, 2003; Schalley, 2019), and in Cognitive Linguistics ontologies concern conceptualizations existing in our minds (Paradis, 2005). Also, Schalley, Musgrave, and Haugh (2014, p. 141) define ontologies as 'a cross-connected network of relevant concepts, which makes explicit, classifies, and organizes the assumptions and terms of the domain in question'.

There is no pre-defined way to construct an ontology; the structure for each ontology is determined by the field of study and more specifically by the object of study (Paradis, 2005; Schalley, 2019). In linguistics there are several levels to consider. Firstly, there is the meta-level, which consists of the linguistic description apparatus which serves to denominate entities and make it possible to analyse and discuss them. Secondly, there is the object level, i.e., the specific lexical meanings being analysed and discussed (Schalley, 2019). Furthermore, lexical meanings hold both encyclopaedic meaning (content structures) and schematic information (schematic structures) (Cruse & Togia, 1996; Murphy, 2000; Paradis, 2005). In language use, content structures and schematic structures are intertwined, but there is a difference in salience, depending on which information is foregrounded (see more in section 2.2 on construals). In this thesis, noun ontologies are attended to in section 3.2, on nominal meanings, and adjective ontologies in section 4.2, on adjectival meanings.

2.2.2 Construals

Construals are the cognitive operations that take place when we are interacting with the world around us. It is how we perceive and interpret our surroundings, i.e., all kinds of information and what happens to us. We cannot NOT construe something; our minds are always active and in interaction with the world. While these mental processes mostly happen automatically and unconsciously, we do have the ability to look at and interpret the same situation in different manners. Construal is reflected in language and inextricably tied to meaning making. Every utterance we make mirrors our construals; there is not a completely objective or neutral way to express ourselves. (Langacker, 1987a). The notion of construal has been explored by a number of researchers, among them Talmy (2000), Langacker (1987a), Croft and Wood (2000), Croft and Cruse (2004), and Paradis (2005).

Croft and Wood (2000) endeavoured to create a systematic overview of different kinds of construals relevant for Cognitive Linguistic, later refined by Croft and Cruse (2004). The overview below is based on their work, on Langacker (1987a), and on Paradis (2005). The left-hand column in Table 2.1 shows the four main types of cognitive processes that are identified, i.e., 1. Gestalt, 2. Salience, 3. Comparison, and 4. Perspective, and the right-hand column provides examples of construal operations. The different construal operations are not mutually exclusive, on the contrary, they are profoundly intertwined and often take place simultaneously (Paradis, 2005; Croft & Cruse, 2004). The table is adapted from Paradis (2005).

Table 2.1
Cognitive processes and construal operations relevant for adjective and noun combinations

	Cognitive processes	Construal operations
1.	Gestalt	Thing/relation, structural schematization
2.	Salience	Profiling, summary/sequential scanning, abstraction, and metonymizaion
3.	Comparison	Categorization, figure/ground, metaphorization
4.	Perspective	Viewpoint, deixis, subjectivity/objectivity

Gestalt

Gestalt stands for the ability we have to form a coherent whole of the conceptual fragments we encounter. As Frännhag (2010, p. 27) puts it, 'to impose structure on any experience we have ─ to give it shape and coherence, so that it forms a unified GESTALT'. The cognitive operation of Gestalt was originally defined by Gestalt psychologists such as Koffka (1935) and Wertheimer (1923 [1950]). Talmy (2000) has

the most detailed discussion of Gestalt in Cognitive Linguistics. Gestalt incorporates both STRUCTURAL SCHEMATIZATION and THING/RELATION (Paradis, 2005).

STRUCTURAL SCHEMATIZATION — In the LOC model, the construal of structural schematization belongs to the schematic domain and concerns the constitution and disposition of an entity, for example to do with SCALARITY and the designation of BOUNDARIES (Paradis, 2005). The designation of boundaries takes place across parts of speech; nouns, for example, are categorized into count nouns (bounded), such as *car* and mass nouns (unbounded), such as *milk*. Verbs are either continuous (unbounded), or non-continuous (bounded), for example *know* versus *cough*. And adjectives are construed either as scalar, or non-scalar, for example *good* versus *identical* (Paradis, 2001). Boundedness and scalarity will be discussed in more detail in section 3.3 on nouns, and section 4.2 on adjectives.

THING/RELATION — A THING is an independent, non-relational entity in conceptual space construed as a noun and often anchored in several content domains. A RELATION is simple, anchored in one content domain and as the term reveals, not autonomous but relational, i.e., involving other entities in addition to itself. In terms of parts of speech they are construed as verbs and adjectives (Paradis, 2005). The notion of parts of speech is not trivial and will be discussed in more detail below.

Parts of speech as construals

The classification of the lexicon into different parts of speech has been an issue ever since antiquity. There are classifications based on morphological, syntactical, and semantic criteria (Schalley, 2019). Lyons, however, argues the irrelevance of which criteria have guided the classification into word classes and emphasizes the importance of their usefulness with regard to forming a set of rules for the construction of 'the maximum number of acceptable sentences and the minimum number of unacceptable sentences among the total set of sentences which the grammar generates' (Lyons, 1968, p. 151). Lyons' criterion is based on an abstract system of grammar in which ambiguous forms and incongruencies are not allowed to exist. In referential models, nouns are semantically defined by referring to entities, verbs to actions, and adjectives to properties, all viewed as existing in an objective world (Paradis, 2005). The main problem with such a model is the occurrence of circularity (Hopper & Thompson, 1984; Paradis, 2005). That is, if the motivation for calling *car*, *disgrace*, or *beauty* entities is that we classify them as nouns, the motivation for them being nouns cannot be that they refer to entities. The same goes for verbs. That is, if the motivation for calling *run*, *resemble*, or *know* actions is because we classify them as verbs, then the motivation for them being verbs cannot be that they denote actions. Evidently, the same is true for adjectives. If we classify meanings such as *good*, *screaming*, or *ideological*

as adjectives because they refer to properties, then we cannot say that they are properties because they are adjectives. Apart from the circularity issue, there are several other reasons why referential models are problematic. For example, many meanings lack real-world referents, such as *beauty*, *knowledge*, and *ideology*. Furthermore, nouns do not always denote entities, verbs actions, and adjective properties (Paradis, 2005).

Hopper and Thompson (1984) argue that, while there might be a semantic aspect related to the different parts of speech, the classification into parts of speech is first and foremost based on pragmatic grounds, more specifically on their discourse function. They propose that word forms as such lack categoriality and that parts of speech are imposed on them only in order to fulfil a certain function in the specific discourse. As such, entities that take the role as 'discourse-manipulable participants' function as nouns, while verbs function as 'reported events', and adjectives are 'property naming' stative meanings (Hopper & Thompson, 1984). While they do not use the same terminology (note that the article was written in 1984) Hopper and Thompson's theory easily goes hand in hand with a cognitive/functional theory, where no sharp line is drawn between semantics and pragmatics and the focus is on function.

Words are considered to be symbolic units with a semantic and phonological pole (Langacker, 1987a, p.189), of which the semantic configuration defines the part of speech. Conceptually, on the level of thought, only two basic configurations are needed, namely, THING and PROCESS. In Langacker's model the difference in construal is that THINGS are summary scanned, meaning that every aspect of the concept is accessible simultaneously, forming a Gestalt which is perceived as static and holistic. The conceptual THING corresponds to the linguistic category NOUN. In contrast to THING, PROCESSES which linguistically correspond to verbs are sequentially scanned. They are relational and occur over time. Adjectives resemble both nouns and verbs. Like nouns, they are summary scanned, not sequentially scanned like verbs. However, like verbs, they are relational. The THING and RELATION Gestalts are the outcomes of different construals, each profiling different aspects of what is being talked about. Linguistic meaning is perspectival and language users choose different construals depending on their conceptualization and what meaning they want to profile in the specific situation. Langacker (1999, p. 11) uses the colour concept of *yellow* to exemplify different construals of the same content:

Yellow is a warm colour (as a noun, *yellow* profiles a summary scanned, particular THING in colour space. Swedish: *Gul* är en varm färg).

Yellow paper (as an adjective, *yellow* profiles a summary scanned colour sensation with RELATION to a THING. Swedish: *Gult* papper).

The paper *yellowed* (as a verb, *yellowing* profiles a PROCESS of gradual change, i.e., sequentially scanned, in a THING (paper). Swedish: Papperet *gulnade*).

The *yellowed* paper (here the participle *yellowed* profiles the end state, i.e., the result of the process of *yellowing*. The process of *yellowing* is sequentially scanned (see the previous example of *yellowed* paper). In contrast, the outcome of the process is summary scanned, corresponding to an adjectival meaning. Participles have an adjectival function in that they profile a property of a THING. Swedish: *Gulnat* papper).

As can be seen above, Langacker's examples of *yellow* (as a noun and adjective), *yellowing* (verb), and *yellowed* (adjective) are directly translatable to Swedish (*gul* (noun and adjective), *gulna* (verb), and *gulnat* (adjective)).

Yet another cognitively grounded way concerning the categorization of meanings into parts of speech is Gärdenfors' suggestion that differently construed meanings are differently anchored in conceptual space. Namely, content words of all parts of speech, except for nouns, refer to meanings in one single domain, whereas nouns differ in that their meanings may refer to concepts in a number of different domains (Gärdenfors, 2014). The parts of speech under investigation in the study in this thesis, that is, nouns and adjectives, are presented in detail in chapters 3 and 4.

Salience

Salience concerns how and to what degree we focus our attention on something, including construals such as summary and sequential scanning, abstraction, profiling, and metonymization, each described below.

Summary scanning versus sequential scanning — If all elements that are needed in order to form a Gestalt are available at the same time, they can be summary scanned, i.e., holistically conceptualized and construed as nouns or adjectives, e.g., *bookmark* and *colourful*. If, on the other hand, they unfold over time they are sequentially scanned as the event is unfolding, they are construed as verbs, e.g., *reading* and *walking* (Langacker, 1987b; Paradis, 2005).

Abstraction — We can choose to observe and depict a situation with a more fine-grained, or a more coarse-grained view (Croft & Cruse, 2004). Abstraction concerns the degree from general to specific, that is, a situation can be depicted in very general, abstract terms, or by a very detailed description. For example, 'My teacher was mean to me' is a very general description, whereas 'My teacher, who always wears black clothes to accompany his dark and serious expression, always criticizes me in front of the whole class', is more detailed. Abstraction is not to be confused with abstractness, i.e., as opposite to concrete.

Profiling — All concepts are interpreted with regard to a profile and a base (Langacker, 1987a). The profiled entity at the centre of attention is the FIGURE, while surrounding entities fall into the background and constitute the GROUND. This terminology was introduced by Talmy (1972), Langacker sometimes uses the term TRAJECTOR and LANDMARK (Langacker, 1987a, 1990; Talmy, 1978). We have the ability to select the component we consider to be most important for our purpose and disregard the rest. While our focus of attention is directed at a specific entity, the profile, our attention encompasses a somewhat wider area, the scope of attention. What is profiled is also what determines the part of speech. A noun profiles a THING, a verb a PROCESS, and an adjective a PROPERTY.

Metonymization — The construal process of metonymization involves picking out a part of something (or something closely associated with it) to represent the whole, or the other way around, using an expression that literally means the whole, but which only refers to a part of it. 'The red shirts won the match' (Paradis, 2004) is an example of the former, when the colour of the clothing is referring to a sports team. 'Canada won the match' is an example of the latter, where the name of the country only refers to a small part of its inhabitants, namely, a sports team.

Comparison

Comparison is a fundamental process which enables categorization and metaphorization.

Categorization — The ability to categorize depends on the comparison with prior experiences and the ability to judge whether a new experience fits into an already established category or belongs to a new category.

Metaphorization — The cognitive operation of metaphorization also depends on comparison, in the sense that we understand and describe something by way of something else. *Cold* and *warm*, for example, are basic meanings from the domain of TEMPERATURE, but are used metaphorically to express personality traits. See section 7.1 for a more detailed account of metaphor.

Perspective

Perspective concerns the viewing arrangement from the standpoints of both perception and conception. Viewpoint, deixis, and subjectivity/objectivity are the construal operations involved (Langacker, 1987). Most obviously, perspective is pertinent to spatial descriptions (Croft & Cruse, 2004) where the speaker's position determines the spatial expression; however, perspective also pertains to abstract, non-spatial domains, such as knowledge and cultural beliefs (Croft & Cruse, 2004).

Viewpoint — Langacker suggests viewpoint as a focal adjustment, distinguishing between two types, namely, vantage point and orientation (Langacker, 1987a). Vantage point refers to the speaker's position, e.g., whether the cat is sitting behind or in front of the tree depends on where the speaker is standing. Orientation relates to the vertical dimension, e.g., if something is positioned above or below something else, with the default vantage point being from a speaker's upright position (Croft & Cruse, 2004).

Perspective — With regard to adjective–noun combinations, adjectives can foreground either schematic structures or content structures. Adjectives such as *absolute* and *possible* emphasize schematic structures, as in *absolute* idiot and *possible* solution, whereas adjectives such as *big* and *wooden* emphasize content structures, as in *big* boots and *wooden* chair (Paradis, 2005).

Deixis — Deictic expressions, such as *here*, *there*, *he*, *tomorrow*, convey meanings which cannot be (correctly) interpreted without knowing the speaker's situatedness in time and space. That is, the interpretation of the utterance relies on a shared common ground (Croft & Cruse, 2004).

Subjectivity/objectivity — Utterances differ with regard to subjectivity and objectivity depending on to which degree the speaker includes the self and her/his view in the utterance. For example, 'Vanessa is sitting across the table' can be perceived as more objectively construed than 'Vanessa is sitting across the table from me', despite describing the same situation.

2.3 Summary

As stated before, this thesis makes use of the model of Ontologies and Construals (Paradis, 2005) as an investigative tool for the study of conceptual development during the school years. Construals make up the operational system applied to ontological structures in meaning making. In this chapter the cognitive operations of Gestalt, Salience, Comparison, and Perspective and the construals that fall under these categories have been presented.

3 Nominal meanings

Formally a noun can be defined as a word that designates entities that are construed as THING. That is, the function of a noun is to profile nominal meanings. Nominal meanings correspond to the mental representations we have of them, and they may or may not exist in the real world. Conventionally, a distinction is made between *noun* and *noun phrase*, or *nominals*. The difference is functional: a noun picks out a type of THING, whereas a noun phrase picks out an instance of the type. Compare 'I like books' with 'I like the books you brought me last week'.

3.1 The structure of the noun phrase

A fundamental characteristic of THING is the conceptual independence or autonomy (Radden & Dirven, 2007). Nouns are the heads of noun phrases and occur in constructions with articles, demonstratives, numerals, adjectives, and relative clauses — that is, noun phrases are internally complex (Taylor, 2002). Conceptually, they are composed of four constituents, each with a specific function (Taylor, 2002): grounding, quantification, specification, and instantiation.

Grounding — It is the speakers' responsibility to make the meaning they want to convey available to the listener. The speaker does that by grounding the instance of THING in the discourse by means of a determiner. Langacker defines grounding of things as the grammaticized means of relating THING to the ground, the ground consisting of the speech event and its participants (Langacker, 2004). The speaker may describe the entity to direct the listener's attention to possible referents and apply a grounding element in order to point to a specific member of the set. When the referent is new in the discourse and not yet known by the listener, the speaker applies indefinite referent elements such as an indefinite article or a quantifier (e.g., 'A book that I read'). When the listener is already familiar with the referent the first time it is mentioned, the speaker uses definite reference such as a definitive article or demonstrative pronoun (e.g., 'The book that I read'). General determination does not require any article in English (nor Swedish) (e.g., 'Women who read are dangerous').

Quantification ─ All types of entities are quantified, and we distinguish between two basic types of quantification, namely, set quantification and scalar quantification. Set quantification entails that the quantity of an entity is measured against a set, which may be either a full set, or a subset. In scalar quantification the quantity is not measured against a set, but with regard to a scale, on which there is a reference point functioning as an implicit norm. Both set and scalar quantification can be partitive and non-partitive. The different types of quantification are constructed by means of corresponding types of quantifiers. It is also noteworthy that (especially scalar) quantification is not limited to constructions with these quantifiers but is evidently also conveyed with an unlimited range of lexical expressions, some more conventionalized than others and many of them figurative, e.g., 'an ocean of books'.

Specification ─ A noun may be described or specified by means of adjectival modifiers and complements. Specification is a distinctive function of adjectives that will be presented in detail in 4.4.1.

Instantiation ─ Instantiation is about linking the concept to a lexical item. In other words, an instance is a token of a type (Radden & Dirven, 2007). A noun by itself designates a type without referring to a specific instance of the type. Once a noun is grounded in a specific discourse situation and thereby in its domain of instantiation (Langacker, 1987b, 2004), the noun picks out an instance of the type. The two following sentences illustrate two basic the structures of the noun phrase.

(De	(tre	(stora	(böckerna))))
(The	(three	(big	(books))))
(Grounding	(Quantification	(Specification	(Type instantiation))))

In addition to the attributive adjective construction in the sentence above, the noun meaning may be modified predicatively by means of a copula:

(De här	(tre	(böckerna	(är	(vackra))))
(These	(three	(books	(are	(beautiful))))
(Grounding	(Quantification	(Type instantiation	(copula	(Specification))))

The two sentences illustrate the two different adjective noun constructions, which are the same in Swedish and English. In 1. the definitive article serves for grounding, the numeral *three* for quantification, and the adjective *big* attributively specifies the nominal *books*. In 2. grounding and specification are identical to 1., but *beautiful*, the adjective specifying the nominal, stands in predicative position. This study investigates constructions such as the ones above with respect to contextual meaning and the relations between the meanings and the functions of these constituents in children's

and adolescents' narrative and expository witing. The focus of this study is on the meaning of the nominal head and its pre- and post-modifiers.

3.2 The content structures of nouns

Lyons (1977) proposes an ontology of noun meanings based on three different categories. Paradis (2005) adopted the proposed ontology in the LOC model, which forms the methodological framework for the semantic annotation of adjective and noun combinations, performed in the corpus study investigating children's and adolescents' adjective and noun usage in written compositions.

Basically, there are three content structures, namely, CONCRETE PHENOMENA (1st order meanings), EVENTS, STATES and PROCESSES /ACTIVITIES (2nd order meanings), and ABSTRACT PHENOMENA (3rd order meanings). Below, I discuss these noun ontologies in more detail.

3.2.1 First order meanings

First order structures are meanings that denote concrete THINGS, i.e., physical objects and phenomena that exist in time and space, comprising domains such as ARTEFACTS, PEOPLE, ANIMALS, and PLANTS, represented by words such as *car*, *child*, *cat*, and *corn*. Physical objects are traditionally seen as prototypical for noun meanings (Lyons, 1968, p. 318; Hopper & Thompson, 1984; Langacker, 1987b). The perceptual properties of 1st order entities are relatively constant, they exist in three-dimensional space, and they are publicly observable (Lyons, 1977; Paradis, 2005).

Concrete THINGS consist of delineated objects (here including people and animals) and substances, which differ with regard to INTERNAL COMPOSITION. Objects are typically made up of many different, heterogeneous parts, together forming a whole. A bicycle, for example, is composed of many different parts, but we perceive it as one single entity. In contrast, substances are generally perceived as homogeneous. There is a basic distinction between count nouns and mass nouns, which for 1st order entities roughly corresponds to the difference in how we construe meanings of objects, such as *car, lamp,* or *coat*, versus substances, like for example *tea, sugar*, and *air*. Objects and substances are construed differently with respect to BOUNDEDNESS and COUNTABILITY, which I will return to in section 3.3.

3.2.2 Second order meanings

Second order entities evoke concepts to do with situations that occur in time, rather than exist in time and space. Second order meanings are primarily situated in the domains of EVENTS (*party, football game, excursion*), STATES (*health, temperature, darkness*) and PROCESSES/ACTIVITIES (*production, growth, dance*). These situational meanings require agents or experiencers to make sense. Figure 3.1 illustrates how the three different situation types of EVENTS, PROCESSES/ACTIVITIES and STATES differ with respect to how they unfold over time, more specifically with regard to whether they are dynamic or static and if they are bounded or unbounded.

SITUATION

DYNAMIC   STATIC

BOUNDED   UNBOUNDED   UNBOUNDED

EVENT   PROCESS/ACTIVITY   STATE

(*death*)   (*growth/jog*)   (*happiness*)
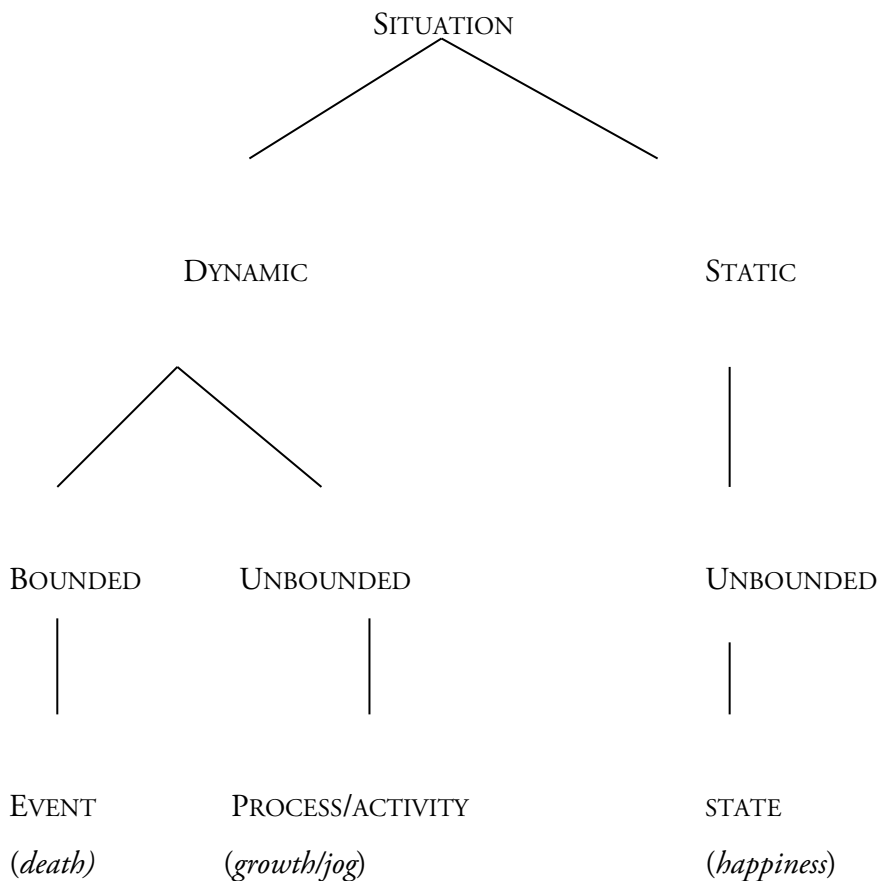
Figure 3.1
Second order entities with respect to content and boundedness (Paradis, 2005)

As can be seen in Figure 3.1 EVENTS are dynamic and involve a change of state. Furthermore, they are usually expected to have a distinct beginning and end, as for example *fall*, *kick*, and *explosion*, hence they are dynamic and bounded. Processes and activities, such as *growth* and *jog*, are also dynamic like events, but they differ from events in that they are unbounded — whereas events are momentary, processes and activities are continuous and often lack a clear starting and finishing point. States, like processes and activities, are also unbounded, but differ from the two other situation types in dynamicity; states such as *happiness*, *ambition*, and *selfishness* are durational and static.

3.2.3 Third order meanings

Third order entities denote completely abstract entities, defined neither by time nor by space. They can be referred to as SHELLS (Schmid, 2000), in the sense that they function as containers for all kinds of abstract properties — entities such as *concepts*, *creation*, *council*, and *current*, i.e., concepts which are part of abstract domains such as LINGUISTICS, CIRCUMSTANCE and IDEA. Depending on the context, they may profile the general meaning of such a domain, e.g., DREAM, or a more specific content of such a domain, e.g., NIGHTMARE, or DAYDREAM).

A nominal lexical item may be profiled as a 1st, 2nd, or 3rd order meaning, depending on which of the qualia roles is profiled in the particular context. Paradis (2005, p. 553) gives the example of *report* which may profile a physical object, i.e., a 1st order meaning as in 'the report is lying on the table', whereas the profiling of the act of reporting leads to a 2nd order construal: 'His report was filled with pauses and stutters'. It is the profiling of the information in the report that results in a 3rd order reading (cf. qualia roles, see section 3.4 and cf. profiling, see section 2.2.2).

3.3 Boundedness and countability

The content part of a word represents the primary meaning we wish to express, but it is at the same time inseparable from the schematic structures that encode different kinds of information about it. In nominal meanings the configuration of BOUNDEDNESS is manifested through COUNTABILITY. Because of differences of BOUNDEDNESS, count nouns and mass nouns differ with respect to COUNTABILITY. Table 3.1 shows examples of bounded and unbounded (i.e., countable and non-countable) 1st, 2nd, and 3rd order meanings in their basic readings.

Table 3.1
Examples of bounded and unbounded 1st, 2nd, and 3rd order meanings

	1st order	2nd order	3rd order
Bounded	tea cup, lamp	lecture, book signing	idea, fact
Unbounded	chocolate, light	boredom, sleep	knowledge, meaning

Objects with discrete boundaries are replicable and countable. However, objects are seldom just randomly counted, but on the basis of belonging to the same category, either based on similarity, function, or maybe even location. This means that countability is a property defined by BOUNDEDNESS, CATEGORY, and CONTEXT. Nouns that denote meanings consisting of one single entity, for example *book*, are called uniplex, whereas *library* (in the sense of a collection of many books), is an example of a multiplex entity, consisting of several, even many, equivalent entities. In contrast to count nouns, mass nouns, not having a set boundary, do not replicate, but instead expand. Adding more of the same substance to some already existing amount does not result in a duplicate, but simply expands the mass and makes it larger (e.g., more chocolate, greater knowledge). In the same way, any subpart of the substance is as valid an instance of the category as the whole mass of it, and consequently, taking away some of it still leaves the instance intact. This is mostly not possible for bounded objects, where the removal of a subpart of the object, does not leave the instance intact, as Langacker writes 'The tail of a cat is not a cat; a piece of pencil lead is not a pencil; and the sequence MNOPQ is not the alphabet' (Langacker, 1987b, p. 66)

The conceptual differences of count meanings and mass meanings are mirrored in their grammatical behaviour. They differ with respect to whether they may take a numeral or form a plural, which type of quantifiers they combine with and in the use of articles and absence of articles. Count nouns can be combined with numerals and are marked for singular and plural, whereas mass nouns do not combine with numerals and usually occur in the singular. Count nouns are quantified by the addition of more objects of the same kind (one book, three books, many books) and they combine with quantifiers such as many and few. Mass nouns are quantified by the addition or subtraction of some amount of the substance in question (after she refilled her cup, there was only a little tea left). They combine with quantifiers such as much and little. These distinctions are directly associated with aspects of their COUNTABILITY. The differences in the use and absence of articles have to do with reference. Both count nouns and mass nouns combine with the definite article (e.g., the idea, the meaning). Only count nouns combine with the indefinite article (e.g., *one idea* vs. *one knowledge*). The original meaning of the indefinite article *a* in English and *en* in Swedish is the numeral *one* and with that underlying meaning still exclusively combines with countable referents. The

use of articles for plural count nouns is the same as for mass nouns. Furthermore, when mass nouns and plural nouns have a generic referent, the article is omitted (e.g., 'Knowledge for the people!').

3.4 Qualia roles

Having discussed the schematic configuration of boundedness in the previous section, this section presents the schematic part/whole structures that operate as configurational templates on nouns. They consist of four qualia roles, namely, the formal, the agentive, the constitutive and the telic role. The notion that nominal meanings are based on a structure of qualia roles was first observed by Aristotle, while in modern linguistics the idea was put forward by Pustejovsky (1995). However, while Pustejovsky considers qualia structure to be characteristics of lexical items, cognitive linguists (see for example Cruse, 2000; Paradis, 2003b, 2004, 2005; Frännhag, 2010) regard qualia structure as conceptual. In this framework, qualia structure is a PART-WHOLE relationship, where one aspect of a summary scanned whole is profiled, that is, made salient in a particular context (PART-WHOLE relationships are treated in more detail in section 7.2 on metonymy). The four roles are each associated with information connected to a specific property, graphically illustrated in Figure 3.2.
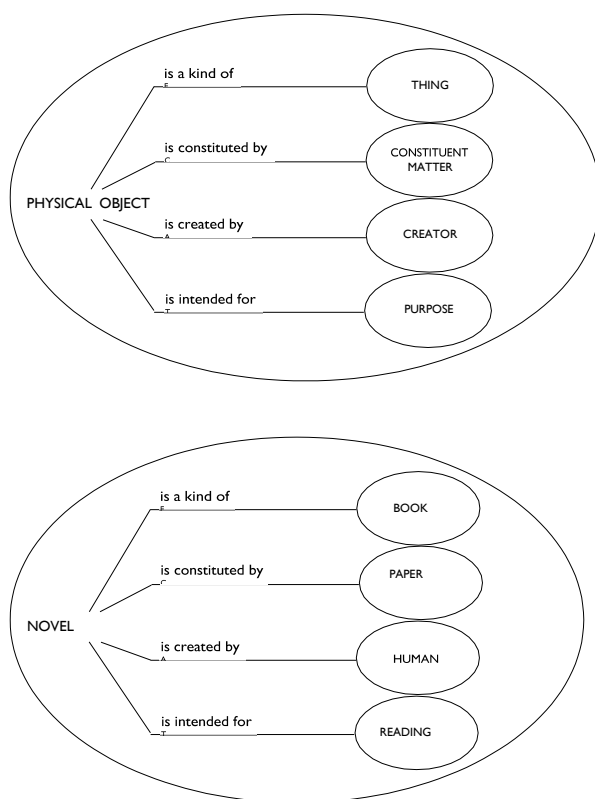
Figure 3.2
Graphic illustration of the conceptual structure of a physical object (Frännhag, 2010) and graphic illustration of the conceptual structure of BOOK

As illustrated in Figure 3.2, the formal role gives us taxonomic information; things are normally part of a system with both superordinate kinds and sub-kinds. The constitutive quale contains information about what something is made of. The agentive role tells us about the existence or course of life of a thing. Things are created at a certain point, and (sometimes going through different stages) have an end. And finally, the telic role is about its function or purpose (Frännhag, 2010, p. 43). As illustrated in Figure 3.2, a novel is a kind of book (formal), made of paper (constitutive), created by humans (agentive), and intended for reading (telic). These structures are very general and to each of them, more specific substructures may be associated. It is the qualia structure of the noun which allows the adjective to hook onto their meanings. The constitutive quale for example, comprises constituent matter, including sensory information, such as COLOUR, SIZE, and SHAPE (Frännhag, 2010).

3.5 Summary

The main objective of this chapter has been to present the structure of the noun phrase and the content and schematic structures of noun meanings. Nouns are the heads of noun phrases and can stand alone, but in sentences they are combined with articles, demonstratives, numerals, adjectives, and relative clauses. Conceptually, noun phrases are composed of four constituents, each with a specific function (Taylor, 2002): specification, instantiation, quantification, and grounding, which are described in detail above. Noun meanings consist of content elements as well as schematic elements. Content ontologies provide encyclopaedic knowledge, while the schematic structures function as configurational templates. The content structure of nouns differs depending on whether they are 1st, 2nd, or 3rd order meanings. The schematic structure consists of four qualia roles, namely, the formal, the agentive, the constitutive and the telic role. The interaction of all the aspects described above points to the complexity of how noun meanings are created and profiled in their specific instantiations. In the study of this thesis nouns are analysed with respect to content ontology and domain. Specification and quantification are part of the noun phrase and are analysed with respect to parameters presented in the next section, devoted to meanings construed as adjectives.

4 Adjective meanings

In contrast to nominal meanings, which are construed as THING, adjective meanings are construed as RELATION (Langacker, 1987b). Adjective meanings express properties that are in relation to THING. More specifically, adjectives modify nominal meanings. As discussed in the previous chapter, nominal meanings have complex structures, which are summary scanned, i.e., all different aspects are accessible at the same time and together they form a GESTALT. Like nouns, adjective meanings are also summary scanned. When modifying a nominal meaning, the adjective directs our attention to a specific meaning aspect of the noun, profiling the relevant attribute in the particular context, and thereby highlights a specific part of the domain matrix. The modelling of adjective meaning is complicated by its strong interrelatedness with the nominal meaning it modifies (Paradis, 2005; Taylor, 1992). The purpose of this chapter is to provide an overview of the most important aspects of the meaning structures that we construe as *adjectives*. Semantic, configurational, constructional, and functional aspects of adjective meanings are considered. The central issue of the conceptual combination of adjective and noun meanings will be attended to in a separate chapter (chapter 5).

4.1 Content and schematicity biased adjectives

There are basically two different kinds of adjectives: content-biased adjectives and schematicity-biased adjectives, both having the subtypes of intrinsic and extrinsic adjectives. When a nominal meaning is modified by a content-biased adjective its schematic structures are backgrounded and vice versa, when a nominal meaning is modified by a schematicity-biased adjective, the noun's content structures are backgrounded. Intrinsic content-biased adjectives highlight an intrinsic property of the noun. *Interesting book*, for example, is different from *political book* in that the property *interesting* is inherent, while *political* is a categorizing adjective, not pointing to some inherent dimension of the noun, but adding a property to the noun it modifies. Intrinsic schematicity-biased adjectives modify nouns with respect to DEGREE (*terrible mess*), FREQUENCY (*frequent occurrences*), and FOCUS (*main reason*), while extrinsic

schematicity-biased adjectives fall into the domains of, for example, ORDER (*first example*) or MODALITY (*possible solution*) (Paradis, 2005, p. 559).

4.1.1 Content structures of adjectives

Both schematicity- and content-biased adjectival meanings express meanings from a wide range of domains, and there are a number of suggestions for adjective categorization (see for example Hundsnurscher & Splett, 1982; Radichi, 1989; Lee, 1994; Dixon & Aikhenvald, 2004). They differ significantly in number of categories, that is, in how general vs. detailed the different categories are. Dixon and Aikhenvald (2004), based on cross-linguistic studies, suggest that languages with a small adjective class tend to include adjectives to do with DIMENSION, AGE, VALUE, and COLOUR. Languages with a medium-sized or large adjective class also have adjectives expressing meanings within the categories of PHYSICAL PROPERTY, HUMAN PROPENSITY, and SPEED. Additionally, adjective meanings within the categories of DIFFICULTY, SIMILARITY, QUALIFICATION, QUANTIFICATION, POSITION, and CARDINAL NUMBER, are found in languages with a large adjective class (Dixon & Aikhenvald, 2004). These categories are all very general and can easily be both added on to and divided into subcategories. Hundsnurscher and Splett's (1982) and Lee's (1994) classifications both encompass a broader range of categories, including categories such as SOCIAL RELATED, MATERIAL RELATED, and GENERAL (Hundsnurscher & Splett, 1982), and ADJECTIVES OF NECESSITY, ADJECTIVES OF POSSIBILITY, and INSTRUMENTAL ADJECTIVES (Lee, 1994). Evidently, the rationale for any kind of categorization lies in what one wants to show, or what function it is meant to fulfil.

4.1.2 Schematic structures of adjectives

Table 4.1 provides an overview of suggested schematicity biased adjective structures, as proposed by Paradis (2005), and elaborated by Frännhag (2010). As much work still remains to be done in this area on adjective meaning, this overview does not claim to be exhaustive – it is to be expected that there may well be additional kinds of schematic information expressed by adjective meanings. The domains in Table 4.1 are presented in more detail below.

Table 4.1
Schematicity biased adjective structures, table adapted from Frännhag (2010)

Schematic domain	Types of meanings
COUNTING SCALE	FIRST, SECOND, THIRD
NON-COUNT SCALE	INTIAL, INTERMEDIATE, FINAL
TIME SCALE	BEFORE REFERENCE POINT, AFTER REFERENCE POINT
CONTAINER	EXTERIOR, INTERIOR
CENTRE-PERIPHERY	CENTRE, PERIPHERY
SPATIALLY ORIENTED WHOLE	FRONT, BOTTOM, BACK, TOP, SIDE
DISTANCE	CONTACT, CLOSE, RELATIVELY CLOSE, FAR APART
QUANTITY	SEVERAL, NUMEROUS, FEW, MANY, MUCH, LITTLE
MATCHING	COMPLETE MATCH, PARTIAL MATCH, NO MATCH
FOCUS (IMPORTANCE)	FOCAL POINT, NON—FOCAL POINT
GRANULARITY	SPECIFICITY, GENERALITY
POSSIBILITY	POSSIBILITY, NO POSSIBILITY
CERTAINTY	CERTAINTY, LOW CERTAINTY
TRUTH	TRUTH, NO TRUTH

The domain of ORDER is internally organized according to three kinds of scale. First, the counting scale, which is bounded at the lower end and open at the other end, and along which we find an indefinite number of points corresponding to distinct numbers, such as FIRST, HUNDREDTH, and THOUSANDTH. Second, we find the non-count scale, which corresponds to an indefinite number of points, although instead of referring to numbers, the points of this closed scale are not exactly specified, but located within three different parts of the scale, namely, INITIAL, INTERMEDIATE, and FINAL, as in *initial attempt*, *intermediate points*, and *final hit.* Finally, the time scale is an open ended scale, with an undetermined number of points in time, stretching infinitely both before and after a contextually defined, specific reference point, as in *previous year, preceding discussions*, and *subsequent events.*

QUANTITY is measured along two types of measuring scales, the type of scale depending on the intrinsic nature of the entity that is to be calibrated relative to the scale (Langacker, 1991a). Discrete entities are measured along the counting scale. The counting scale measures specific values such as THREE, FORTY, and HUNDRED, but also designates more imprecise quantities such as SEVERAL, MANY, and FEW (*several instances, many cars, few children*). The continuous scale of magnitude, on the other hand, measures quantities of entities with a non-discrete mass, with values such as MUCH and LITTLE (*much water, little hope*). Both the counting scale and the continuous scale are bounded at the end that designates a zero value, and unbounded at the other end.

DEGREE is structured in two different ways, depending on whether the adjective meaning is bounded or unbounded. Bounded adjective structures are complementary, i.e., their property is construed in terms of either/or. For example, a person is either *dead* or *alive*, *married*, or *unmarried*. Bounded adjective meanings are modified by degree modifiers such as *completely* or *absolutely* (Paradis, 2008). The degree of unbounded meanings is calibrated relative to values on a (continuous) scale. The entity that is calibrated necessarily has to have an intrinsic aspect of gradeability, as is most often the case for properties or actions, as in *awful mess* or *fast game*. In the many cases where the DEGREE adjective modifies a non-gradable entity, for example a first order entity like PERSON, as in *absolute idiot* or *heavy smoker*, the adjective still modifies an aspect that is gradable, namely, idiocy and smoking. In these cases, the noun does express a gradable property, even if it profiles a non-gradable first order entity such as PERSON. The boundedness of the scale against which DEGREE is calibrated depends on the boundedness of the aspect that is being calibrated (Paradis, 2008).

The concept of FREQUENCY is complex, as it involves aspects from several different domains, namely, the domains of TIME (e.g., *often*, *rarely*), DISTANCE (e.g., *close*, *far between*), and QUANTITY (e.g., *few*, *many*) (Frännhag, 2010). FREQUENCY pertains to something that repeatedly (QUANTITY) happens at certain a distance in the domain of TIME. In other words, events that occur frequently are plenty and happen with short distances in time, whereas infrequent events are few and happen with longer distances in time. The scale along which FREQUENCY is measured is unbounded at both ends and goes from low to high FREQUENCY. Furthermore, the scale is divided into two parts, the dividing point being some contextually defined norm (Frännhag, 2010).

In the domain of DISTANCE, the space of separation between two entities is measured along a scale that is bounded at the end that designates a point of contact (that is, where there is no distance at all between the entities), and open at the other end, since the maximum distance between two entities cannot be defined. DISTANCE is relational, expressing both deictic and non-deictic relations. Deictic relations define the DISTANCE between the conceptualizer and another entity, as in *nearby shop*, or *distant area*, whereas non-deictic relations express a DISTANCE relation between two entities independent of the conceptualizer, as in *adjoining rooms* and *close lines*.

CONTAINER, CENTRE-PERIPHERY, and SPATIALLY ORIENTED WHOLE, are 'all configurational image schemas, with no sense of axiality to them' (Frännhag, 2010, p. 106). SPATIALLY ORIENTED WHOLE is defined as 'a conception of a completely schematic object with a fixed, inherent orientation in space' (Frännhag, 2010, p.106). They mention the front (*front door*), the back (*back yard*), the side (*side window*), the top (*top shelf*), and the bottom (*bottom drawer*). Adjectives in the CONTAINER domain specify either something interior (as in *inner voice* or *internal combustion*), or something

exterior (as in *outside world* or *external antenna*). Finally, adjectives to do with CENTRE-PERIPHERY express meanings such as *marginal regions*, *outermost areas* and *central cafés* and *central heating*.

MATCHING corresponds to comparison. Adjectives that express matching indicate the degree of perceived similarity or difference between entities. The scale runs from completely different to complete match and is thus bounded at both ends. The adjectives found within this domain express either the state of no similarity at all (*different clothes, another man*), the intermediate state where there is partial match (*similar ideas, like occasions*), or the state of complete match (*identical pen, same dress*).

FOCUS and GRANULARITY are both domains within the higher order domain of ATTENTION. FOCUS designates the degree of attention where, when the attention is strong, it is concentrated at a FOCAL POINT, in contrast to a lesser degree of attention, or designated IMPORTANCE, with a NON-FOCAL POINT. IMPORTANCE and FOCUS are closely intertwined, in the sense that we focus our attention on what we find important. FOCAL POINTS are expressed by adjectives such as *main concern* and *prime objective*, whereas NON-FOCAL POINTS are mentioned by adjectives such as *secondary issues* and *minor problem*. The same phenomenon, the same FOCAL POINT, can be viewed with different degrees of detail observed. GRANULARITY is about the level of specificity at which something is observed (Frännhag, 2010). GRANULARITY is expressed by adjectives in utterances such as *general definition, main classes,* and *specific question*.

EPISTEMIC MODALITY encompasses concepts such as TRUTH (e.g., *accurate*, *dishonest*), CERTAINTY (e.g., *undoubtable*, *dubious*), and POSSIBILITY (e.g., *potential*, *unattainable*). These three different scales are all bounded at the positive end, at the point of absolute truth, absolute certainty, and complete possibility. POSSIBILITY and TRUTH seem to be bounded at the negative end, too, since negative expressions of POSSIBILITY and TRUTH combine with degree modifiers such as *completely*, whereas this pattern is not observed for negative expressions on CERTAINTY (Frännhag, 2010).

4.2 Degree and boundedness

Degree and boundedness are part of the schematic configuration of adjective meanings. Neither boundedness nor degree are properties of word classes or individual words (Paradis, 2001), but are ways in which we construe meanings. Degree can be expressed by comparison or by degree modifiers. Paradis (1997, 2000) identifies two different kinds of degree modifiers, totality modifiers and scalar modifiers. Totality modifiers are either maximizers such as *absolutely (perfect)*, *perfectly (wonderful)* and *completely (crazy)*

(Swedish equivalents would be *helt (perfect), fullkomligt (underbar), fullständigt (galet)*), or approximators such as *almost (complete)* (*nästan (fullständig)*, *nearly (free)* (*nästan (gratis)*) and *virtually (unchanged)* (*praktiskt taget (oförändrad)*)). The group of scalar modifiers consists of boosters such as *extremely (cold)* (*extremt (kallt)*), *highly (irritated)* (*extremt (irriterad)*) and *very (happy)* (*mycket (glad)*), moderators such as *fairly (simple)* (*ganska (enkel)*), *pretty (good)* (*rätt (bra)*), and *rather (uncomfortable)* (*relativt (obekväm)*), and *diminishers*, such as *a bit (warm)* (*en aning (varm)*), *a little (cold)* (*lite (kall)*) and *somewhat (surprised)* (*något (förvånad)*).

The boundedness configuration is a basic way of structuring the conceptualization of entities (Paradis, 2001; Hartman, 2016). There is an extensive literature discussing boundedness in association with nouns and verbs. Boundedness in nouns is associated with countability, i.e., whether the noun meaning is construed as a count noun (*jug, car, chair*) or a mass noun (*milk, sand, air*) (see section 3.3). For verbs, boundedness is discussed in terms of aspectuality and telicity, i.e., states or events that are either continuous (*grow, eat, jog*), or non-continuous (*explode, crash, knock*). Paradis (2001) suggests that boundedness is an equally fundamental characteristic of adjectives, situated within the domain of gradeability, where gradable adjectives differ with respect to whether they are associated with a boundary or not.

Adjective meanings often have a typical interpretation, i.e., the basic meaning expressed by the adjective may make it biased to be construed in a certain way. A first distinction can be made between adjective meanings that are gradable and those that are non-gradable, i.e., some adjectival content structures may lend themselves to be graded, while other types of content structures are more suitable as non-gradables and hence more often used as non-gradables. But just like the content part of the adjective, the configuration too is susceptible to different construals, and the configuration that appears to be used more often is easily modulated and changed by context. Non-gradable meanings, such as *American*, *daily*, or *wooden*, are typically not compatible with degree-modifiers, yet expressions like *a very American boy*, or *a very wooden chair* would still be easily interpretable in a given context.

Gradable meanings, i.e., adjectival content structures that lend themselves to be graded, might (1) represent qualities that are either there or not/are either true or false (2) they may represent qualities that can be thought of in terms of more or less, or (3) they represent meanings that are at one extreme end of a scale. The first kinds of meanings divide some conceptual domain into two distinct parts, and are not associated with a scale, while the latter two are meanings that are associated with a scale. As will be discussed below, there are different kinds of scales, and depending on whether the adjective is associated with a scale or not, and if it is, what part of a scale the meanings

operate on, and whether the scale is bounded or not, gradable adjective meanings may either be scalar or non-scalar, bounded or unbounded.

First, meanings such as dead/alive and married/unmarried are not associated with a scale, but rather conceived of in terms of either/or. These meanings bisect the conceptual domain into two distinct parts, and are associated with a distinct boundary (Paradis, 2001; Croft & Cruse, 2004). The two different parts are complementary, and by nature contradictory. 'The cat is alive' entails that 'The cat is not dead', and the meaning of a sentence like 'The cat is neither dead nor alive' is perceived as paradoxical (Paradis, 2001). Paradis calls this type of adjective limit adjectives. Limit adjectives combine with totality modifiers, i.e., maximizers such as *totally*, *perfectly*, and *absolutely*, and approximators such as *almost*, *nearly*, and *practically*.

Secondly, adjectives that we think of in terms of more or less are scalar adjectives (Paradis, 2001). Scalar meanings such as thick, thin, good and bad, operate in the mid-range of an open-ended scale (Croft & Cruse, 2004), they are fully gradable and not associated with a boundary. The mode of opposition of scalar adjectives is antonymy. Antonyms are counter-directional, which means that, when intensified, one of the terms expresses a higher value along the given dimension, and the other term a lower value. Scalar adjectives implicitly function in comparative manner; the notion of something being short, for example, only works in relative comparison (Cruse, 1986). Scalar adjectives combine with scalar modifiers of all kinds (Paradis, 2001).

Some properties, such as clean/dirty, can be construed in terms of both non-scalar and scalar adjectives, depending on whether they express a bounded meaning with an either/or construal, as in 'this shirt is dirty', or a more/less construal 'this shirt is dirtier than that one' (Croft & Cruse, 2004).

Extreme adjectives are the third kind of adjective identified by Paradis (2001). They typically express bounded meanings associated with an extreme end of a scale. Two types of extreme adjectives may be distinguished, calibratable meanings that can be objectively measured, such as empty and full, and evaluative meanings such as excellent and horrible. Both types are readily combinable with maximizing totality modifiers like *absolutely*, *perfectly*, and *completely*, but only calibratable meanings combine with approximators like *almost* and *nearly*. Extreme evaluative adjectives combine with *most* (as in for example 'it was a most fantastic place', or 'it was a most horrible experience'). Figure 4.1 (Paradis, 2008) provides a schematic overview of the configurational meaning structures of adjectives discussed above.
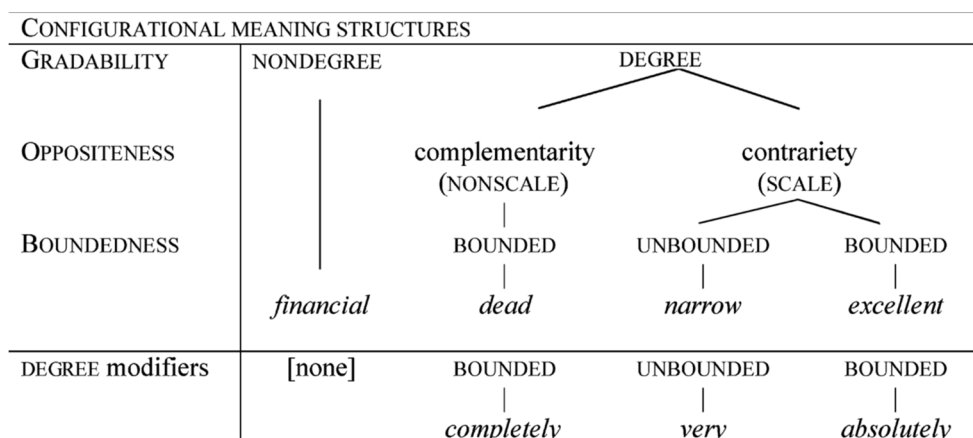
Figure 4.1
The UNGRADABLE/GRADABLE dichotomy, the type of oppositeness based on scalarity, BOUNDEDNESS and the interaction of SCALE and BOUNDEDNESS (Paradis, 2008)

In Figure 4.1 *financial* is given as an example of a lexical item that is typically non-gradable. In its non-gradable configuration, the meaning is associated with neither oppositeness nor boundedness, and it does not take degree modifiers. Note, however, that, given the right context, a gradable meaning is conceivable, as in for example 'This is a very financial question'. Complementary meanings, such as *dead* in Figure 4.1, are not associated with a scale, but with something being complementary, i.e., conceived in terms of either/or, as in *dead or alive*. These kinds of meaning structures combine with bounded degree modifiers such as *completely*. Again, in certain contexts, a scalar construal is possible, e.g., 'This bug is almost dead'. Contrary meanings, i.e., scalar meanings, can be bounded or unbounded. Unbounded meanings such as *narrow* combine with unbounded degree modifiers such as *very*, whereas bounded scalar meanings such as *excellent* combine with bounded degree modifiers such as *absolutely*.

4.3 Attributive versus predicative construction

Whether the adjective modifies the nominal meaning in attributive or predicative position makes a significant semantic difference. Adjectives in attributive position add information about the noun, without necessarily putting this information into focus. In other words, conveying this information is not the main aim of the statement. Rather, it is the whole situation that is in focus (Frännhag, 2010). In contrast, when the specific aim is to convey information expressed by an adjective, i.e., when the purpose is to put the adjective meaning in focus, it is used predicatively. What

information is focalized in a sentence often has to do with its newsworthiness. It is possible to test which information is the main news in a sentence by using question-answer pairs. Kaiser and Wang (2021, p. 2) provide the following example:

Speaker A:

What did you think of the orchestra's performance?

Speaker B:

? The amazing orchestra included five prize-winning violinists.

? The orchestra, which included five prize-winning violinists, was amazing.

The orchestra was amazing. It included five prize-winning violinists.

Only the last reply (c), with the adjective in predicative position, sounds completely natural.

According to Bolinger (1967) another difference between attributive and predicative adjectives is that predicatively positioned adjectives often modify properties that are less time-stable than attributively positioned adjectives, e.g., 'my nervous friend' describes a friend with a nervous personality, whereas 'my friend is nervous' describes a friend who for some reason is temporarily nervous. Hopper and Thompson (1984) suggest that the more stative the basic meaning of an adjective, the more easily it can be used attributively as part of a noun phrase to describe a permanent property (e.g., 'the black cat'). Finally, a recent study by Kaiser and Wang (2021) showed that adjective meanings in attributive positions are more likely to be interpreted as objective facts, whereas predicative adjective meanings are more likely to be judged to be subjective. Consider for example 'the bookseller was subjected to unfair competition' vs. 'this competition is unfair'.

The aspects of meaning differences between attributive and predicative adjective meanings outlined above are all valid and acknowledged in this thesis. I do, however, want to make explicit what they boil down to: It is the function of the adjective in a particular instance, i.e., what aspect of the nominal meaning the adjective is meant to profile, determining in which construction the adjective is used. The different adjective functions are discussed in section 4.4.

4.4 Adjective functions

The function of adjective modifications has received little attention within the research community. Warren (1984a, b, c, 1989) has been one of the few researchers studying

adjective functions. Focusing on attributive adjectives, she identified three main functions: description (e.g., 'a beautiful book'), classification (e.g., 'it's an antique book'), and identification (e.g., 'please hand me the red book'). In her thesis, Frännhag (2010) scrutinizes these functions, investigates them in further detail, and identifies two further functions, namely, identity provision and stipulation. In this thesis, the adjectives in the data are annotated according to the functions that Frännhag identified and with that I adopted her terminology. Description is henceforth specification, classification is termed kind identification, and identification is called element identification.

4.4.1 Specification

The role of specifiers is to describe some aspect or detail of a concept. In contrast to the other adjective functions, specifiers are not part of the meaning creation as such, but their function is to add information. Whereas all the other functions can only be applied within the relevant element structure, i.e., attributively, specifiers can function in both attributive and predicative position. The two different uses evoke two slightly different construals: external specification makes the specification as such salient ('The dress I bought is black'), whereas internal specification puts the content of the whole meaning combination into focus ('I bought a black dress'). It follows that the speaker chooses external specification, when (s)he wants the specification to be highlighted (see more about adjective construction in section 4.3). In addition, there are also cases where attributive representation is not possible: 'In cases of non-referring elements, for instance, any internal contentful meaning will inevitably be interpreted as an identity provider. Consequently, if such an element is to be specified, external predicative specification is the only option available (e.g., A hungry tiger is dangerous ≠ A dangerous hungry tiger)' (Frännhag, 2010, p. 207).

4.4.2 Kind identification

Kind identification roughly corresponds to the function called *classification* in earlier theories (e.g., Warren, 1984a), but Frännhag's definition of kind identification provides a more detailed and elaborate account of the function. Kind identification works by what Frännhag refers to as comparison redirection at the morphological level. The meaning that is expressed by one or more lexical meanings is compared against other members of their domain until the appropriate match is found. *Brown bread*, for example, is compared to *white bread*, *solar power* to, among others, *wind power* and *nuclear power*. When the right match is found, the addressee directs his/her attention

to the identified concept. Frännhag identifies three processes by which kind identification may be achieved by adjectival meanings:

1. Endocentric kind identification is realized by the lexical meaning of a prenominal adjective only, as in for example *circular saw* and *brown bread.* The meaning of the noun gives access to a number of subordinate kind concepts. These concepts can be taxonomically immediate combinations, or distant combinations. In immediate combinations, the noun profiles a concept that is directly superordinate to the concept identified by the adjective, with no intermediate taxonomic level between the concept that is represented by the noun and the meaning profiled by the adjective, as in for example *high chair* and *electric train*. In endocentric kind identification, the adjective functions as a pointer directing our attention to the intended level of specificity, i.e., the adjective highlights an aspect of the noun meaning that is more specific than the meaning represented by the basic level noun only.

1. In distant combinations, the meanings represented by the noun and the meanings identified by the adjective are only connected via some intermediate levels of taxonomic organization. *Intensive care* and *plastic surgery*, for example, both represent sub-kinds of superordinate concepts, where *intensive care* is a kind of medical care, and *plastic surgery* a kind of surgery.

2. Kind identification may be also be manifested by the lexical meaning of a prenominal adjective and the lexical meaning of a noun in parallel, as in for example *cerebral palsy* and *blackthorn*. Both the meaning of the noun and that of the adjective highlight aspects of a separate third concept, without any reference to a subordinate. Here both the noun and the adjective function as kind identifiers, since they both match some specific information referring to a concept that is different from the one given referred to by the noun only.

3. The meaning of the combined adjective–noun meaning as a whole can serve as a kind-identifying function. Before the addressee realizes that the two meanings are tied to the same entity, (s)he might construe the two meanings separately, as in for example *softball* and *redbreast*.

To summarize: in 1. it is the noun meaning that defines and delimits the possible meaning candidates, in 2. the noun and the adjective both function as kind-identifying, and in 3. it is the adjective-noun combination as a whole that functions as kind-identifying.

Kind-identifying adjectives highlight different kinds of information, mainly information to do with:

1. *Genericness* deals with whether a certain piece of information refers to all exemplars of the kind or is delimited to some particular exemplar(s).

2. *Distinctiveness* concerns whether a particular piece of information is restricted to the relevant kind, or if it is shared with other kinds on the same taxonomic level in the relevant domain.

3. *Categorizing relevance* is about whether or not a particular piece of information makes the foundation of the relevant kind-of-thing concept, the foundation being the knowledge that makes the basis for the kind in question. Defining the classificatory bases can be a complicated matter since it often is not self-evident and can be complex and multifaceted. The foundation may be based on function (e.g., hammer, saw), constituent matter (e.g., wood) and many other things. The foundation is what defines and determines the delimitation.

Frännhag suggests that there are two main ways in which kind-identifying adjectives focus on information: they either focus on information in a simple, attributive way, as in for example *broad bean*, *red pepper*, and *public transport*, or in a more explanation-like way, as in *atomic bomb*, *digital recording*, and *direct current*. In the first set of examples, simple attributes are pointed out, as *broad beans* are broad and *red peppers* are red, and *public transport* is for the public, while in the second set of examples the information is more complex and has an explanatory function: in *atomic bomb*, the adjective incorporates information both about the component structure of the bomb and how it works, *digital* in *digital recording* tells us something about how the recording was created, and *direct* in *direct current* is about the way in which the electricity flows.

4.4.3   Element identification

The function of identifiers is to restrict the number of potentially intended entities (Frännhag, 2010), for example, asking someone for the *blue book* (not the *red one*), or telling someone to sit at the *round table* (not the *square one*). Element identification is similar to kind identification in several ways, in that both:

1. reflect some information that is unique to the intended element

2. can reflect complex chunks of information, either in a partial or a summarizing way (element identifiers may also convey simplex attributes in a one-to-one way)

3. can be realized in either an endocentric or exocentric way (i.e., the meaning of the head noun either serves as a reference point that gives access to a limited set of potential element candidates, from which the intended one is picked out

by means of an identifier, or the head noun might itself have an element identifying function, in parallel with any other identifier).

The function of element identification is to indicate the intended referent of a noun, where the referent as such is noun phrase independent. This means that the addressee has access to information additional to what is given in the relevant noun phrase. The addressee may already have established an independent notion of the referent or might do so when the noun phrase draws attention to it. The noun phrase independent information may be conveyed through three different situations:

1. Preceding linguistic input, e.g., 'She couldn't decide which book to buy — one was a historical novel set in France, the other was about Virginia Woolf. She decided on the biography.'

2. Immediate physical context, e.g., 'See those books? The one with a blue cover is a Virginia Woolf biography.'

3. Prior experience, e.g., 'Which of the Virginia Woolf portraits did you like best at the museum? The one by Vanessa Bell?'

The definite determiner indicates that the relevant element has already, or may readily, be picked up on. Once the addressee is aware that the intended referent is available, (s)he starts to search for a conception that seems to fit the intended meaning. Since the definite determiner also indicates that all information required for the identification of the intended element is already given in the relevant noun phrase, once the addressee has found an element that mirrors the noun phrase, (s)he can be confident to have found the right one.

Although, element identifiers pick up on information that is already there and do not add any new information themselves, they do contribute by making the meaning richer and more specific. By the choice of adjective, the speaker is framing the referent in a particular way, thus providing information about what attribute is most important to the speaker at that particular moment.

4.4.4 Identity provision

When the intended element belongs to a structural space and is unknown to the addressee, the adjective and noun serve to provide identity. It can even be said that they call the intended element into existence, since elements belonging to a structural space are non-referential and are created just for the current discourse. It follows that identifiers also have a restrictive function, since they automatically decide the scope of the relevant element, and as an effect, they thereby specify what exactly is referred to.

In 'Vintage magazines are treasures for some collagists', for example, we learn that for some collagists magazines in general are not necessarily treasures, but *vintage magazines* are. And the statement 'Antique scissors are beautiful' makes clear that we are not talking about scissors in general, but the speaker has created the category of *antique scissors* for this particular discourse.

4.4.5 Stipulation

Stipulation has the function of specifying a condition something has to meet in order to qualify as the intended referent for the relevant element. This applies in propositions where the particular element that fulfils the specific condition is still non-specific and is yet to be picked out, as for example in 'I'm looking for a black pen' and 'You need a big bowl for this', where the specific *pen* and *bowl are* not yet determined. In these cases, it is not a particular exemplar that is important, but 'rather a random identity in its capacity of embodier of a particular description' (Frännhag, 2010, p. 203). As a consequence, this particular description cannot be changed, without changing the communicative intent. In an utterance such as 'I'm looking for the black pen', *black* can be substituted by other defining adjectives (*cheap, expensive, small*), and still refer to the same element, whereas this is not possible when the adjective functions as a stipulator, for example in 'I need a black pen', *black* cannot be replaced with *small* without compromising the original intent of the proposition.

4.5 Summary

The intent of this chapter has primarily been to present different kinds of adjective meanings (i.e., content- and schematicity-biased adjectives), how the position of the adjective (i.e., attributive or predicative) affects the meaning, and how these aspects are determined by the function of the adjective in the particular instance. The focus in this thesis is on the development of adjective-noun combinations and the view taken is that in the particular communicative situation the specific adjective meaning is determined by the noun it is modifying, and vice versa, the noun meaning is influenced by the adjective meaning. In the next chapter, theories of conceptual combinations and of adjective-noun combinations will be presented and discussed.

5 Conceptual combinations

> Conceptual combination refers to the cognitive process by which people use two or more concepts to construct a new conceptual entity that a single concept is insufficient to describe (Xu & Ran, 2011, p. 128).

Traditionally, compositional analysis has been the way of looking at conceptual combinations in linguistics. Compositionality refers to the principle that the meaning of a complex expression adds up to the meaning of its components. The reasoning is that the meaning of a combination of words equals the referents of the intersections of those words (Murphy, 2004). For example, the combination *golden scissors* refer to the set of entities that are golden and that are scissors. While this approach may work for a small set of adjectives whose meanings are relatively 'stable', one only has to extend it to gradable adjectives to see that it becomes problematic. A *small giraffe* does not refer to a set of anything that is small (unless it is a toy or a picture), but to a giraffe that is small relative to other giraffes. Adjectives that can stand in attributive position only to convey a certain meaning also pose problems to this view of meaning, e.g., an *easy chair* is not a chair that is easy, and a *frozen metaphor* is not a metaphor that is frozen. Furthermore, almost the only type of noun-noun combinations that would accurately refer to the intersection of the referents of their individual meanings are those where the first noun refers to the material of which the referent of the second one is made, e.g., *metal bench* or *plastic bag*. Also, the notion proposed in compositional analysis that noun-noun combinations are symmetrical is falsified by the examples such as *houseboat* vs. *boat house*, *desk lamp* vs *lamp desk*. While having had a wide appeal in traditional linguistics, the compositionality is not only psychologically inconceivable, but, as can be seen from the examples above, even problematic from a strictly lexical semantic view (Murphy, 2004).

5.1 Emerging attributes and typicality effects

Another effect of conceptual combinations that contradicts the theory of simple compositionality is the emergence of novel attributes. These are attributes which cannot

be assigned to either of the conceptual components. For example, in a study investigating the combination of social concepts, a blind lawyer was considered intelligent but not courageous, whereas a blind marathon sprinter was not judged as intelligent by any participants but was considered courageous. Similarly, neither Harvard-educated people nor carpenters were considered to be unmaterialistic, but a Harvard-educated carpenter was judged to be just that (Kunda, Miller, & Clare, 1990).

In such cases, the modification of one dimension leads to the modification of several others, which in turn leads to the emergence of new, sometimes very unexpected meanings. Three different cognitive processes are suggested to lead to the emergence of new attributes, namely, extensional feedback (Gray & Smith, 1995; Hampton, 1988, 1997; Medin & Shoben, 1988; Rips, 1995), inferential reasoning (Estes & Ward, 2002), and the increase of salience of an already existing, but inconspicuous attribute (Estes & Ward, 2002). Extensional feedback is the drawing of information from previous encounters with the same conceptual combination. The example of pet bird (Hampton, 1988) can illustrate the phenomena. If we have come across a pet bird, or at least the notion of pet bird, before, we might be able to draw from memory that (some) pet birds can talk – even though usually, neither pets nor birds can talk. Inferential reasoning, on the other hand, refers to the ability to deduce the attributes of the conceptual combination. If we assume, for example, that a squirrel box is a box in which to keep a squirrel, we may draw on encyclopaedic knowledge to infer that the box has air holes so the squirrel can breathe (Estes & Ward, 2002). The last cognitive process suggested to evoke the emergence of new attributes is when a pre-existent, albeit non-salient attribute gets highlighted by the modification and a shift of focus takes place, bringing out a new meaning.

Two conceptual factors that seem to promote the originating of new attributes in complex concepts are typicality and relevance, both of which have proved to have an inverse relationship to emergence, although in different ways. Listeners expect any modification of meaning to be relevant to the message conveyed to them, and thus when a typically irrelevant attribute is modified, the listener will try to make sense of the unexpected modification. For example, normally, the colour of an orange is not a relevant feature to highlight, since all oranges have the same colour; however, if the colour aspect is modified (e.g., *a black orange*), we expect this to be for a reason. In this way, by shifting the focus from the more obvious traits of a concept to some aspect that normally is not salient, the modification of normally irrelevant dimensions may produce emergent attributes (e.g., we might conclude that a black orange is a rotting orange). The maximally irrelevant conceptual modifications are those where the modifying concept is not applicable to the concept being modified but requires a metaphorical construal to make sense, as for example an expression like *shark lawyer* to

describe an aggressive lawyer (Estes & Glucksberg, 2000). Thus, irrelevance, or even unrelatedness, promotes the emergence of new, original attributes (Baughman & Mumford, 1995; Mobley et al., 1992).

Similarly, typicality also has an inverse relation to emergence. The more atypical a conceptual combination, the higher the chance of new emerging attributes. Estes & Glucksberg (1999, 2000) suggest that this can be explained by Grice's (1975) principles of communication. The listener assumes that any modification, even a so-called anomalous one, is made for a purpose and that the attribute that gets highlighted by the modification is central to the message.

Over the past 40 years, a number of theories trying to explain cognitively plausible models for how conceptual combinations are construed have been suggested. Some of them focus only on noun-noun combinations (e.g., Dual Process Theory (Wisniewski 1997a, 1997b; Wisniewski and Love 1998); Interactive Property Attribution Model (Estes and Glucksberg2000); Composite Prototype Model (Hampton 1987, 1988, 1990, 1991); Constraint Model (Costello & Keane 2000, 2001); CARIN model (Gagné 2000, 2001; Gagné & Shoben 1997)), some only on adjective-noun combinations (e.g., Selective Modification Model, Smith & Osherson 1984; Smith, Osherson) Ambiguity and Vagueness in Adjectives (Warren, 1988)), and some include both noun-noun and adjective-noun combinations (e.g., Fuzzy Set Theory (Zadeh 1965, 1976, 1982; Osherson & Smith, 1982); Amalgam Theory (Thagard, 1984), and Coherence Theory (Thagard, 1989, 1997)). Most of them (although not the Fuzzy Set Theory and the Coherence Theory) propose schematic models trying to explain the causal relationships in conceptually combined meanings.

Until now, no satisfactory account of all aspects of conceptual combinations and the cognitive processes that underlie them has been presented. Much work remains to be done in this area. In the next section (5.2) on adjective-noun combinations my focus will be on how adjectives hook on to noun meanings via their different qualia roles, the adjective functions as they do so, and how the adjective and noun meanings shape each other.

5.2 Adjective-noun combinations

In an adjective-noun combination the interpretation of the adjective depends on the noun the adjective is modifying and vice versa, the noun meaning is determined by which of the noun's qualia roles the adjective is targeting. Completely different domain matrices (cf. section 6.1.1) may be activated due to the nature of the specific noun. The

domain of the adjective is determined by what kind of meaning it highlights in a noun. In 'his computer is broken', *broken* profiles a meaning in the domain of CONSTITUTION, whereas, in 'his heart is broken', *broken* profiles a meaning in the domain of EMOTION. The adjective gets its exact reading on the occasion of use since the meaning, even within one and the same domain, is relative. Hot water in *a hot bath* is hot, but still different from *hot tea water*, which needs to be much hotter still, but would be scalding in a bath.

However, as described in detail in chapter 4.4.1, specification (i.e., description) is but one of several other adjective functions. Kind identification (i.e., classification), element identification, stipulation, and identity provision are other adjective functions (as identified by Frännhag, 2010) creating and profiling different noun meanings. Before Frännhag, Warren (1984) was one of the few researchers investigating adjective functions. Her focus was on classifying, describing, and identifying adjectives in attributive position. She proposed that adjective meaning consists of two semantic elements, the referential content and the relation between the adjective and noun (the relator), both of which one needs to be aware to fully understand the adjective meaning. The referential content is overt, the meaning of *big* in *big house*, for example, is directly accessible, while the relator is covert. The relator is the connecting link between the adjective and the noun, determining which of the noun qualia the adjective hooks on to. Examples of underlying relations between adjective and noun are causation (*electric shock*), constituting (*criminal assault*), containing (*magnetic field*), and experiencing (*happy boy*). Figure 5.1 illustrates Warren's model.

'a happy boy'

ref. content – HAPPINESS   relator – EXPERIENCING
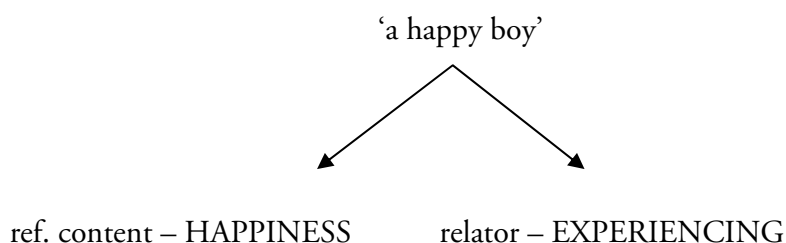
Figure 5.1
Warren's model of the two semantic components of adjective structure

Depending on the nature of the relator, the adjectives and nouns take on different roles, such as SOURCE, RESULT, ORIGIN, OBJECT, etc. Table 5.1 shows an overview of semantic relations between adjectives and nouns, and the roles they may take on.

Table 5.1
Adjective and noun roles and their relations according to Warren

Role combination	Relator (CONNECTING LINK)	Example
SOURCE-RESULT	constituted by	criminal case
RESULT-SOURCE	constituting	criminal assault
NORM-ADHERENT	in accordance with	conventional methods
COMPARANT-COMPARED	resembling	Roman nose
WHOLE-PART	belonging to	vocal tone
PART-WHOLE	having	rational creature
PLACE-OBJ	occurring in/on	celestial bodies
OBJ-PLACE	containing	magnetic field
ORIGIN-OBJ	deriving from	domestic sewage
TIME-OBJ	occurring in/at	nocturnal illumination
OBJ-TIME	during which – prevails/prevailed	nuclear age
AFFECTED OBJ-ACTOR	dealing with	medical officer
CAUSER-RESULT	caused by	electric chock
RESULT-CAUSER	causing	pathetic boy
GOAL-INSTRUMENT	be for	athletic equipment

To uncover the relator, Warren uses paraphrasing, which is a neat way of making covert relations visible. For example, *a happy boy* is a boy that feels (experiences) happiness. Uncovering the relator is a way of explicitly showing that the adjective takes on different meanings, depending on which noun it modifies. In other words, while the content part stays the same across different usages, the relation may differ, and as mentioned earlier, it is the relator that determines which one of the noun's qualias is being modified.

'a criminal boy'

ref. cont. – CRIMINAL   relator – **CAUSING**

'a criminal assault'

ref. cont. – CRIMINAL   relator – **CONSTITUTING**
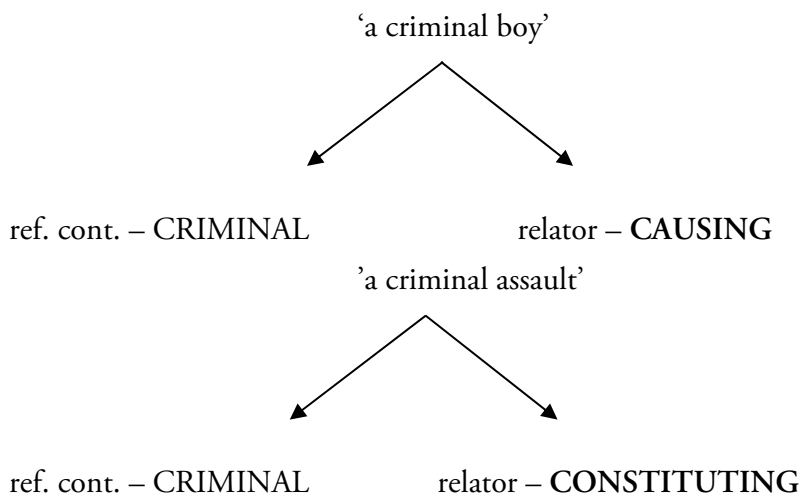
Figure 5.2
'*Criminal*' relating differently to two different nouns

Figure 5.2 show CRIMINAL as CAUSE in *a criminal boy* where the adjective has the role of AFFECTED OBJECT and *the boy* takes on the role of ACTOR. *A criminal assault*, is an assault constituting a crime, where the adjective may take on the role of RESULT and the noun that of SOURCE (Warren, 1984).

Making the covert relation between adjective and noun visible and explicit is one of the great benefits of Warren's model.

As described in section 4.4.5, the function of stipulation, as proposed by Frännhag (2010) is to profile a certain condition something has to meet in order to qualify as the intended referent. For example, the bowl has to be big, the popcorn salty, and the film a good one, in order for a family gathering to take place. In other words, the function of the adjective is not to modify a certain aspect of the noun meaning, but to profile a specific noun quale as a condition that needs to be met.

Identity provision (Frännhag, 2010) also has a restrictive function. In contrast to stipulation, however, this restriction does not concern a particular referent, but evokes a non-referential general category defined just for the current discourse. For example, in 'big windows are good for letting in light', the category of *big windows* is created.

5.3 Summary

My aim in this chapter has been to highlight how complex the issue of conceptual combination is. I present the long-time dominating theory of compositionality and explain why it does not hold up. Moreover, the phenomena of emerging attributes and also typicality effects show that there are not only several cognitive processes involved in the interpretation of conceptual combinations, but evidently, context and our knowledge of the world are of significant importance as well. In the second half of the chapter, I focus on adjective-noun combinations and how their respective meanings influence each other and are, furthermore, determined by the function of the adjective and which aspect of the noun meaning the adjective modifies. When studying the development of adjective use, it is crucial to keep in mind the complexity of creating meaning with conceptual combinations. In the next chapter theories of conceptual domains will be presented and discussed.

6 Domains

In the previous chapters the focus has been on adjective and noun meanings and how intricate their interaction is in the creation of meaning. In this chapter, the focus is on the interconnectedness of meanings. Concepts can be associated either due to some form of similarity, or because they are relevant in the same context (one or more). Concepts that are grouped together either way belong to the same domain. Often concepts are part of a number of domains. A RECEIPT, for example, is part of both the domain of financial transactions and the domain of shopping. The notion of domains has been explored by a number of Cognitive Linguistic researchers. Frännhag (2010, p. 19) accessibly describes domains 'as coherent areas of human experience that provide the necessary contextual- and background knowledge for understanding of other, more specific concepts.' Confusingly, different researchers have used different words for more or less the same concept. For example, Langacker also uses the term *base,* the term *frame* stems from Fillmore, and Lakoff coined the term ICM (Idealized Cognitive Model).

6.1 Langacker's approach to domains

In *Foundations of Cognitive Grammar* (1987a) Langacker expounds his theory of domains. To make sense of word meanings/concepts, they need to be viewed in a specific context. This context is made up of all the background knowledge we have about the concept and how it relates to the world. This background knowledge consists of our encyclopaedic knowledge, and in order to make this knowledge easily accessible, it is organized in structures that he calls domains. In other words, domains provide the encyclopaedic knowledge that is necessary for the understanding of a lexical concept. Langacker discusses the notion of domains in terms of three aspects:

- the reducibility of domains to more fundamental cognitive structures

- the intrinsic organization of a domain

- the distinction between locational and configurational domains.

As regards the first aspect, Langacker makes a distinction between basic domains and abstract domains. Whereas basic domains are not definable relative to other even more basic concepts, abstract domains can simultaneously serve as both sub-domains and superordinate domains for different concepts. The SCHOOL domain, for example, is a sub-domain within the EDUCATION domain, but at the same time, it contains the sub-domains of SCHOOLTEACHERS, SCHOOLBOOKS, SCHEDULES, etc. The term abstract, in this context, does not refer to intangible entities. On the contrary, concepts in what Langacker calls abstract domains are often concrete entities that exist in time and space. In contrast to abstract domains, basic domains can only be superordinate, since the concepts that form basic domains are basic in the sense that they are not derived from any underlying concept that is even more fundamental. Lakoff and Johnson argue that even the most abstract concepts are grounded in embodied experience and therefore constitute basic domains (Lakoff & Johnson, 1980; Johnson, 1987). In other words, basic domains are called basic domains because they are directly anchored in human bodily experience. Often cited examples of basic domains are TIME, SPACE, EMOTION, COLOUR, and PITCH.

Secondly, while Langacker finds it important to make an inventory of which basic domains there are, in order to more readily understand human conceptualization, he also thinks it is crucial to gain some understanding of the intrinsic structures of domains. He proposes that domains, both basic and abstract, are structured in terms of one or more dimensions. The basic domains of TIME, PITCH, and TEMPERATURE are examples of domains that are structured in a one-dimensional way, whereas for example the COLOUR domain is organized with respect to three different dimensions, namely, hue, brightness, and saturation. But not every domain is structured in such a neat and straightforward way, Langacker's view of the domain of EMOTION, for example, is considerably more complex. He suggests a number of structuring parameters that might be useful for the concepts of EMOTION, such as the classification into positive and negative emotions, degree of arousal, etc. In addition to the organization of concepts along different dimensions, Langacker also points out that, with respect to a given dimension, domains are either bounded or unbounded. Abstract domains may be either bounded or unbounded at one or both ends, where the ALPHABET is an example that is bounded at both ends and ETERNITY an example which is unbounded at both ends.

The third aspect that Langacker discusses with regard to domains is the distinction between locational and configurational domains. A location is defined by a single point on a dimension, whereas a configuration consists of several points construed as one Gestalt. Following this definition, the domain of TEMPERATURE, for example, is locational, since a temperature is defined by a specific point on one dimension, while a TRIANGLE is configurational, since it is defined by several points on three different

dimensions. He also provides the example of finger as a domain for knuckle, and hand as a domain for finger. According to Langacker, a configuration is independent of its position and orientation in space, a triangle is a triangle whichever way you turn it, while changing the position of the point in the temperature domain will result in a different temperature. Gärdenfors and Löhndorf (2013) consider that the examples of domains given by Langacker make up two different categories, namely, a dimensional and a meronymic category. While they agree that the domains of TEMPERATURE and COLOUR, for instance, are dimensional, Langacker's examples of finger as a domain for knuckle, and hand as a domain for finger, constitute meronymic structures rather than domains. An illustrative difference between them is that parts of meronymic structures are exchangeable, they can be replaced by a corresponding part and still form the same concept. If a book loses some pages and they are replaced with other pages, it is still a book. It is not possible, however, to exchange one colour for another in the colour domain without evoking change. Orange, for example, cannot be replaced by another colour (e.g., pink) without changing the content of the domain (Gärdenfors & Löhndorf, 2013).

6.1.1 Domain matrices

Most concepts are defined in relation to several domains simultaneously; TELEPHONE, for example, is part of at least two domains: the domain for ELECTRONIC DEVICES and the domain for COMMUNICATION. Together, all the domains that a certain concept is linked to form the domain matrix of the concept. The domains in a domain matrix are not all equally central; some domains may generally be evoked when speaking about something, while knowledge in other domains might only be evoked in certain contexts. When speaking of a telephone, for example, one does not necessarily think of the fact that it was invented by Alexander Graham Bell in the 1870's. Langacker defines the centrality of domains by conventionality (i.e., how conventional the meaning is in the speech community), genericity (how general the knowledge is), characteristicity (in the sense of being unique in comparison to other members of the class) and intrinsicality (in the sense that reference to external entities is not needed). However, when the model is applied to actual language use, it is the context in which a word is used that governs which concepts and domains in the domain matrix are highlighted, i.e., which domain is profiled in this instantiation of language use.

6.2 Types of domains revisited

While the basic idea of domains seems reasonable and useful for the categorization of meanings in all kinds of language use, the notion is still somewhat fuzzy. One aspect in the literature on domains that easily leads to confusion is that the discussion of domain as a theoretical construct and model on the one hand, and language instantiation on the other hand, is confounded. There are a number of articles (e.g., Clausner & Croft, 1999; Croft, 2002; Croft & Cruse, 2004; Gärdenfors & Löhndorf, 2013) that discuss the term domain, all of which, more or less, fall back on chapter 4 of Langacker (1987a).

Croft and Clausner (1999) question Langacker's division between locational and configurational domains and argue that locationality and configurationality are properties of concepts rather than of domains. They show that the domains that Langacker calls configurational can support both locational and configurational concepts. SPACE, for example, supports locational here and configurational triangle and TIME supports locational NOW and configurational WEEK.

As mentioned above, Gärdenfors and Löhndorf (2013) find that Langacker's (1987a) distinction between configurational and locational domains is misleading. There are two reasons. First, not only locational domains are based on dimensions, but when taking a closer look, the configurational domains too can be deconstructed into a dimensional analysis (Croft & Clausner, 1999; Gärdenfors & Löhndorf, 2013). To illustrate this, Fiorini, Gärdenfors, and Abel (2014) use the domain of APPLE. APPLE constitutes a complex configuration, as its properties are anchored in a diverse number of quality domains, such as the COLOUR, TASTE, SHAPE, TEXTURE, SMELL, and NUTRITION domains. These domains are dimensional domains (e.g., COLOUR), or themselves anchored within a dimensional domain (e.g., SHAPE is configured out of SPACE). The rationale is that if one recognizes that all domains ultimately are based in higher level dimensional domains, even complex configurations can be analysed in terms of dimensions when they are deconstructed.

Furthermore, Gärdenfors and Löhndorf (2013) suggest that meronymic relationships should not be defined as domains. They argue that domains can be defined as a set of integral dimensions which are separable from all other dimensions. For example, the three dimensions of colour, hue, chromaticness and brightness are integral dimensions that are separable from other quality dimensions, e.g., the weight of an object. An essential reason for separating a cognitive structure into domains is that it allows for different properties of a concept to be recognized independently.

6.3 Summary

The purpose of this chapter has been to present the notion of domains and some relevant theoretical considerations. In the tradition of Langacker (1987a), the view in this thesis is that concepts get their meaning in the particular context in which they are used. The context consists of all the background knowledge we have about the concept. This encyclopaedic knowledge is organized as domains. In contrast to Langacker, however, the view is that both locational and configurational structures can be deconstructed into a dimensional analysis, with dimensions being anchored in one or more domains. Meronymic structures, however, are considered to be part-whole relationships rather than domains. In this thesis, the modified version of Langacker's notion of domains, as defined by Gärdenfors and Löhndorf (2013), is applied to analyse both adjective and noun domains.

7 Figurative language

Previous chapters have primarily focused on basic, i.e., non-figurative meanings. In this chapter, the focus turns to metaphors and metonyms. Thoughts and opinions about metaphor can be traced back as far as Aristotle, who considered it to be ornamental and appropriate for poetry. This is called the decorative view of metaphor, where metaphor is seen as rhetorical flourish (Lakoff & Johnson, 1980). The decorative view of metaphor was dominant until the end of the nineteenth century. Paradis (2008) reminds the reader that that metaphor is a communicative phenomenon operating at the conceptual level and not mere ornament. It is pervasive in language and thought, and also an important device for language change.

While the theory and definition of metaphor has undergone fundamental change since antiquity, the opposite is true for metonymy. The anonymous author of the treatise *Rhetorica ad Herennium* (see Koch 1999, p.140) describes metonymy as 'a trope that takes its expression from near and close things ['ab rebus propinquis et finitimis '] by which we can comprehend a word that is not denominated by its proper word' (Panther & Thornburg, 2007).

Croft (2002), among others (based on the analysis of metaphor by Lakoff and Johnson, (1980), and Lakoff, (1993)) defines metaphors as a conceptualization of a meaning based in one domain, in terms of a meaning in another domain. In contrast, metonyms are based on conceptualizations within the same domain. While some researchers only see minor weaknesses in the theory (for example Barcelona, 2002; Kövecses & Radden, 1998), others question the fundamentals of the theory (for example Riemer, 2001; Barnden, 2010). However, the notion of domain in itself, even if it goes under different names, seems unquestioned. In the LOC model, the framework on which the analysis in this thesis is based, metaphor and metonymy are considered construals. More specifically, metaphor is a comparison between two domains, whereas metonymy is a part-whole or whole-part construal of salience within one domain (Paradis, 2015).

7.1 Metaphor

Lakoff and Johnson's book, *Metaphors We Live By*, in 1980, articulated the central points of Conceptual Metaphor Theory most fully (Lakoff & Johnson, 1980; Lakoff, 1993). Lakoff and Johnson argue that metaphor plays a central role in thought and is indispensable to both thought and language. We form conceptual structures based on our perception and experience of the world and our acting in the world. We then use these structures to organize thought. Production and comprehension of metaphorical language are mediated by metaphorical mappings across conceptual domains. Metaphorizations are seen as regular and predictable mappings between a source and a target which preserves the image-schematic structure. Our understanding of the concept of LOVE, for example, is guided by analogies that assimilate the target concept LOVE with the source concepts, such as for example JOURNEY, e.g.,

- Look how far we've come.

- It's been a long bumpy road.

- We're at the crossroads.

These expressions can be seen as mappings from a source domain (JOURNEY) to a target domain (LOVE). There are ontological correspondences according to which entities in the domain of LOVE correspond systematically to entities in the domain of a JOURNEY. The lovers are travellers on a journey together, with their common life goals seen as destinations to be reached, and the relationship is the vehicle which allows them to pursue these common goals together. We are able to make inferential generalizations, i.e., all of the above examples are about LOVE, but they can also be about other activities, e.g., CAREERS conceptualized like JOURNEYS. In this view, metaphors are used to facilitate the understanding of certain concepts. Thus, when we take information from one domain and project it onto a second domain, the latter receives the structure from the former. In the examples above, the abstract domain of LOVE is structured by the more concrete domain of physical movement, with the result that we actually conceive LOVE using the metaphor LOVE IS A JOURNEY.

Conceptual Metaphor Theory has been criticized partly for its vagueness, partly because it uses only linguistic evidence to argue in circular fashion for deep conceptual connections between language and thought. How do we know that people think of SAD as DOWN? Because people use expressions such as 'he is depressed'. Why do people use expressions like 'he is depressed'? Because people think about SAD in terms of DOWN (Glucksberg 2001). A common criticism is that linguistic intuitions alone, even those

of trained linguists, are insufficient and unreliable for establishing what people do to produce and understand language (Glucksberg 2001).

Zinken (2007) is one of the researchers who picks up on the criticism that cognitive linguistic approaches to metaphor have been too vague with regard to the link they assume to hold between analogical schemas and verbal behaviour. He states that: 'Being explicit about the link one assumes between behavioural data and theoretical constructs is essential for a falsifiable account of semantic schematization in general and figurative language and thought in particular' (Zinken, 2007, p.446). This is, of course a valid argument, expressed by other researchers as well, but it has not by any means been left unaddressed. The number of studies showing that the link between theory and behaviour is neither vague nor solely intuitively motivated is accumulating (e.g., Gibbs, 2012, 2017; Gibbs & Santa Cruz, 2012).

7.1.1 Embodied cognition and metaphor

In fact, an increasing number of studies (Chemero, 2009; Gallagher, 2006; Gibbs, 2006, 2019; Jensen & Cuffari, 2014) show that Conceptual Metaphor is grounded in embodied experience and embodied simulation, confirming Lakoff and Johnson's admission that 'no metaphor can ever be comprehended or even adequately represented independently of its experiential basis' (Lakoff & Johnson, 1980, p. 19). While it is true that the initial metaphor-research boom evoked by *Metaphors We Live By* mostly focused on processes in the human mind, i.e., what is typically called cognition, in the past 15 to 20 years there has been additional focus on embodiment and embodied cognition (which is a much broader idea, not only pertinent for language).

Based on a growing body of research, Gibbs (2019) argues that metaphor is always based on an embodied ecological experience unfolding over time. This view is based on the assessment that cognition is not only centred in the human mind, i.e., the brain, but is embodied, enactive, embedded, and extended (Chemero, 2009; Gallagher, 2006; Gibbs, 2006, Jensen, 2018). In essence, the claim holds that cognition happens in context and as an interaction of processes happening in the brain, body, and environment. Metaphor, which thus in this view is not restricted to a notion of language, or even of language expressing concepts in the mind, is something we are living, and it functions as an important part of ecological cognition (Gibbs, 2019).

The concept of embodied cognition as coined by Barsalou (1999) suggests that concepts evoke mental simulations of physical experiences. As human beings we engage with the world (internal and external) via our senses and the different stimuli are communicated via different specialized neural pathways. The interaction with a car, for

example, is made up of a multitude of perceptions, among others its shape, smell, and sound, and these sensory impressions are processed in different brain areas such as the visual cortex, olfactory cortex, and auditory cortex. However, this information then gets immediately integrated in a multi-modal, neural, so-called convergence zone (Barsalou, 2003; Barsalou et al., 2003), creating a conceptual whole.

A great many conceptual metaphors are grounded in body-internal experiences. These metaphors are called primary metaphors. They are defined by being directly associated with a sensorimotor experience, such as TEMPERATURE, on the one hand, and a subjective experience simultaneously, such an EMOTION, on the other hand (Grady, 1997; Lakoff, 1993; Lakoff & Johnson, 1980). AFFECTION IS WARMTH is an example of one such primary metaphor. In an experiment by Williams and Bargh (2008) participants considered another person to have a warmer personality, that is, to be more generous and caring, when they held a warm cup of coffee in their hands than when they held a cup of cold coffee in their hands.

Different emotional experiences often elicit the same kind of behaviours universally. PRIDE, for instance, makes people take an expansive posture and raise their arms over their heads, shame on the contrary makes people shrink by hanging their head and slumping their shoulders. This is true both across different cultures and also of congenitally blind people, which indicates that this is not a question of learned cultural behaviour (Tracy & Matsumoto, 2008). These kinds of bodily expressions are regarded to be the foundation of embodied metaphors such as GOOD IS UP, a concept which experiments have shown to be mirrored in a number of other behaviours. In a study by Meier and Robinson (2004), for example, the polarity of words shown higher up on the computer screen was judged to be more positive than the polarity of words shown in the lower part of the screen. In another experiment by Brunyé et al. (2012), people's memories were skewed to place the location of positive events higher up on a map and negative events lower than the place where the event (e.g., winning a prize vs. having an accident) actually occurred. In the same vein, Crawford et al. (2006) conducted a study in which participants remembered pictures with positive content to have been shown higher up on the screen than they previously had and pictures with negative content lower down on the screen. IMPORTANCE IS WEIGHT (Ackerman, Nocera & Bargh, 2010), GOOD IS CLEAN and BAD IS DIRTY (Zhong & Liljenquist, 2006), and CHANGE OF STATE IS MOTION (Lakoff & Johnson, 1980) are other examples of recognized primary metaphors. Primary metaphors are fertile ground for the generation of more complex metaphors. AFFECTION IS WARMTH, for example, could generate a metaphorical use like 'warm rays of sunshine stroke her cheeks', just as 'her opinion lends weight to the argument' is derived from the primary metaphor IMPORTANCE IS WEIGHT.

Primary metaphors have been assumed to be universal. However, closer examination of metaphors from different cultures has shown that even a pervasive primary metaphor such as UNDERSTANDING/KNOWING IS SEEING shows cultural variation. In Australian languages, for example, knowledge is not associated with sight, but with hearing (Evans & Wilkins, 2000) and the Ongee on the Andaman Islands in the South Pacific use smells in their categorization of experiences (Ibarretxe-Antuñano, 2008a). These cultural variations UNDERSTANDING/KNOWING IS SEEING/HEARING/SMELLING, e.g., 'I *saw* that there was going to be trouble'/I *heard* that there was going to be trouble'/ 'I *smelt* that there was going to be trouble' (Ibarretxe-Antuñano, 2008, p. 22) could be encompassed in the more general metaphor COGNITION IS PERCEPTION (Ibarretxe-Antuñano, 2008a, 2013). Ibarretxe-Antuñano (2013) suggests the metaphor of the cultural sieve to illustrate how metaphors arise. The physically grounded experience is filtered through a cultural sieve, resulting in a physically and culturally grounded metaphor. For a more detailed analysis of the metaphor-culture interface, see Kövecses (2010). While I will not provide a more detailed description here, it is important to remember that the embodied-ecological view on metaphor puts equal importance on ecology (i.e., context, environment, culture) as on embodiment. In different instantiations of metaphor their weight may differ, but both always play a role.

The behavioural data of the studies cited above is indisputable, however, not all researchers agree that it necessarily supports the theory of embodiment. See Casasanto and Gijssels (2015) for a critique of (parts of) the embodied metaphor theory.

7.2 Metonymy

In contrast to metaphor, metonymy does not involve a cross-domain mapping, but instead consists of a referential shift within the same domain or domain matrix. Radden and Kövecses (1999, p. 21) offer the following definition, building on Langacker (1993): 'Metonymy is a cognitive process in which one entity, the vehicle, provides mental access to another conceptual entity, the target, within the same cognitive model.' (Cognitive model corresponds to the notion of domain.) In essence, metonymy is a part-whole or whole-part relationship.

A specific occurrence is influenced both by world knowledge and by the particular context in which it is created (Paradis, 2004). While the source (*vehicle* in Langacker's terminology) and the target of a metonymy are associated by contiguity (Peirsman & Geeraerts, 2006), the strength of the conceptual link varies depending on the conceptual distance between source and target, as well as the salience of the source (Panther & Thornburg, 2007).

Considering how pervasive metonymy is in language, it seems reasonable that it serves a communicative purpose and that the processing cost outweighs the communicative gain (Papafragou, 1996). For example, saying 'The hamburger is waiting for his check' might take less effort to process for both the speaker and the hearer than 'The man who ordered a hamburger is waiting for his check'. By picking out a part of some concept when we communicate, we are directing the focus of the listener to that specific aspect of it, that is, we foreground certain information. Croft (2002) calls this process domain highlighting. Domain highlighting involves a shift of foregrounding something in the primary domain of a concept, to the foregrounding or highlighting of something in a secondary domain, within the same domain matrix. In the following example about *Time* magazine, where the primary domain is the printed newspaper, there occurs a shift to a secondary domain, namely, *Time* magazine as a publication company:

Time took over Sunset magazine, and it's gone downhill ever since.

The interpretation of a metonymic expression depends on the conceptual unity of the expression, i.e., all the components of the expression must be interpreted in a single domain. The following statement, for example, only makes sense if all the components are interpreted within the domain of politics:

Denmark shot down the Maastricht treaty.

If one of the parts, for example Denmark, were to be interpreted in a different domain, say in the domain of sports, the sentence would not make sense anymore. Croft (2002) considers the manipulation of experiential domains to be a central aspect of the communication and understanding of figurative language.

Within the LOC model Paradis (2004) suggests a more constrained definition of metonymy and distinguishes between three different kinds of construal operations: *metonymization*, *facetization*, and *zone activation*, which are all construals of salience within the part-whole configuration of what is traditionally referred to as metonymy.

In metonymization proper, the source and the target refer to two distinct senses, which in a different context would indicate two different referents (Paradis, 2004). In 'The red shirts won the match', for example, *shirt* stands for *player* in a sports context, but in most other contexts the two meanings *shirt* and *player* refer to two different referents with two very different meanings. Facetization is different, in that the lexical item which is used has several connected meaning facets, one of which is the referent in a given context. The construal operation is the same, but the conceptual distance evoked by the expression is smaller than for metonyms proper. *Court*, for example, can refer to a building, the staff working there, the law practised there, or a unit of administration. In 'The court had to assume that the statement of claim was true', *court* refers to the

judge handling this specific case. In other words, facets are readings within senses, where the lexical item refers to one aspect of several possible readings. In contrast to both metonymization and facetization, zone activation does not highlight a concept or a specific aspect of a concept but focuses on one of the referent's qualia roles. In the example 'I have a really slow car' it is the function of the car as a means of transport that is highlighted, and furthermore that it might not be ideal in its function, since it does not go very fast.

7.3 Summary

Being central tools of communication, metaphor and metonymy are pervasive in thought and language. They arise through different construal operations. Metaphors are created by means of a cross-domain mapping grounded in the interaction of bodily perceptions, personal experiences, world knowledge and culture. They help us express primarily abstract meanings by means of more concrete phenomena. Metonymy is a part-whole/whole-part relationship based on contiguity and within-domain mapping. The role of metonymy is primarily referential, and by picking out a specific aspect of an entity it focuses our attention on something that is salient in the situation, and thereby helps our understanding of it. Just like the debate about the nature of abstract concepts, the phenomena of metaphor and metonymy are still intensively investigated and discussed. The more we understand about the construals of figurative language in general, the more specifically we can look at relevant aspects of development. However, looking at the development of metaphor and metonymy production might also contribute to a greater understanding of these construals as such.

The chapters up to this point serve to provide a theoretical background of aspects relevant to this thesis, and furthermore, to outline the framework within which this study is performed. Since this is a thesis studying development, the next chapter addresses language development. The chapter will consider some more general, but central, questions of language development, and then put special focus on adjective and noun development.

8 Language development

This thesis is embedded in the Cognitive Linguistic framework, therefore the developmental course outlined in this chapter takes the stance of a usage-based approach to language acquisition and development. Within the usage-based framework it makes sense to study language development beyond the first four years of life and even beyond the beginning of adolescence since there is the potential for it to be a lifelong process. Once a child has mastered the basic and most fundamental skills for communicating through language, the process continues: more complex language resources and meanings are learned, understanding widens and deepens, and both spoken and written language production are continuously refined. In this chapter I will discuss what it means to know a word, differences between early word learning and later language development, and I will then focus on aspects of adjective and noun acquisition and development specifically – during both early and later language development. The chapter closes with a very brief overview of writing development and a section on writing in different genres.

Many aspects of adjective acquisition and development, such as boundedness and gradeability, constructional use, and adjective domains, will be presented as aspects of early language learning. Studying adjective acquisition in young learners is important since it points to the complexity of adjective and noun acquisition. Aspects that are difficult for very young learners may well be under development even during the school years. Furthermore, it provides an overview of what is currently known about adjective acquisition.

The studies I describe in this chapter refer to studies about both early and later language development, including both natural and experimental data. Furthermore, while the studies are performed with children and adolescents speaking different languages, the studies I discuss are of the kind that I find comparable to the Swedish data and which I judge to be pertinent to my study.

8.1 Conceptual development

A prerequisite for learning language is the forming of concepts. In turn, the capacity to categorize, that is, to recognize sameness across different instances of things, actions, and properties, is a precondition for the ability to form concepts. The human mind is not limited to draw on information from memory but is able to generalize and abstract to form concepts and to use these concepts in reasoning. Lexical categories would not exist if it were not for the ability to categorize and form concepts.

The extension of categories is as broad as our knowledge of the world and beyond, since the mind can conceive of ideas, phenomena, persons, objects, etc. that do not physically exist in the external world. We perceive the external world as structured (one can take the natural world as an example) and it is reasonable to assume that these structures encourage the mind to form categories. Humans are not the only species with this capacity, and many categories in nature exhibit sufficient structure to be learned by many organisms (for example pigeons and monkeys), not only humans (Sloutsky, 2010; Zentall, Wasserman, Lazareva, Thompson, & Ratterman, 2008).

According to the view taken in this thesis, children acquire categories by making use of the general cognitive ability of comparison, with no a priori knowledge structures being presumed. As Sloutsky (2010, p. 4) puts it: 'conceptual knowledge as well as some of the biases and assumptions are a product rather than a precondition of learning.' The input children get is not considered flawed, but highly regular, and learning mechanisms, such as statistical and attentional learning, help children to extract those regularities (French, Mareschal, Mermillod, & Quinn, 2004; Mareschal, Quinn, & French, 2002; Rogers & McClelland, 2004). Both basic level categories (e.g., dogs) and broader ontological classes (e.g., inanimate vs. animate) show perceptual similarities within the members of the categories and differences from members of other categories. Recognizing the similarities and differences among entities leads to the forming of categories (Rakinson & Poulin-Dubois, 2001; Samuelson & Smith, 1999). When acquiring categories, children take advantage of a number of different kinds of cues and even correlations of cues. Category structure, perceptual cues, and linguistic cues (such as for example count and mass noun distinctions), may pose statistical constraints that help with the formation of categories (Samuelson & Smith, 1999). The cues that language provides support the forming of more abstract distinctions and the lexicalization of them allows for the learning of more and more abstract concepts (Sloutsky, 2010).

Cross-modal information integration is a prerequisite for learning words. It is the capacity to integrate cross-modal information which is central to the ability to start

learning any cross-modal category (for instance that humans speak, cats meow, and dogs bark). More specifically, word learning calls for the ability to bind sensory and auditory input. Once this ability has developed, a child can start to learn words. To begin with, the child learns words that refer to already known perceptual categories. Furthermore, the capacity of processing cross-modal information makes it possible for children to use both perceptual and linguistic cues in order to learn broad ontological categories (Jones & Smith, 2002; Samuelson & Smith, 1999).

Following the ability of processing cross-modal information is the acquisition of dimensional values and words, such as size, colour, or shape. The learning of these types of dimensions requires further development of the prefrontal cortex and the development of executive functions such as the ability to focus on relevant features and ignore irrelevant features. Further development of the prefrontal cortex is also what is required for the acquisition of abstract concepts. However, interestingly and in contrast to perceptually dense categories, where the concept might be acquired before the word, the learning of abstract concepts often starts with the word (Vygotsky, 1964). A small child can be heard using words for abstract concepts such as LOVE, TIME, or EQUIVALENCE, without knowing the meanings (Dale & Fenson, 1996). The meaning applications are likely to be learned over time and exposure, some of them with the help of explicit instruction.

According to Sloutsky (2010), the developmental course is predominantly determined by three aspects. First, the structure of the category to be learned plays a role. Second, the learning systems in the brain that subserve the learning of different category structures are critical. And third, the developmental course of these structures may decide when a certain type of categorization becomes accessible to a child. Below follows a more detailed (although not exhaustive) account of how humans, starting with the categorization of simple perceptual groupings, can arrive at complex conceptual knowledge.

8.1.1 Category structures

The internal structure of categories varies. While some categories are coherent in that their members have numerous features that overlap (e.g., LAMP, CAR), other categories may only overlap in one single dimension (e.g., SHAPE, like square things). Researchers such as Rosch et al. (1976) have observed that this is mirrored in categories at different ontological levels. Basic level categories tend to have multiple overlapping features (e.g., BIRD), whereas superordinate levels generally have fewer features in common (e.g., ANIMAL). Kloos and Sloutsky (2008) propose a measure for these structural differences, which they call statistical density. This measure is a function of within category

compactness and between category distinctiveness. Categories that are statistically dense exhibit multiple shared category-relevant features (e.g., cars usually have four wheels, a steering wheel, windows, etc.), while those categories with few overlapping features are sparse categories (e.g., the superordinate category VEHICLE does not have as many overlapping features as car). The calculation of density rests on variation in stimulus dimensions, variations in relations among dimensions, and attentional weight of stimulus dimensions (see Sloutsky, 2010, p. 1251 for a more detailed description). Dense categories are normally acquired without the need for supervision, whereas (some) sparse categories might not only need supervision, but also additional instruction.

As mentioned above, the acquisition of dense perceptual categories may precede word learning. Thus, when a child starts learning words for such categories they are mapped onto already familiar categories (Merriman, Schuster, & Hager, 1991; Mervis, 1987). There are a number of studies that show that four- to five-year-old children perceive categories with shared labels (i.e., two different objects are called the same name), or phonologically similar labels, as more similar than when the items are presented without labels, or with different labels (Sloutsky & Fisher, 2004; Sloutsky & Fisher, 2012). Furthermore, a study by Deng and Sloutsky (2015) showed that salient visual features had higher effects on category learning than words. However, since there is evidence that adults usually treat words as symbols, rather than features, this relationship is subject to developmental change. Lexicalization is key in the transformation from categorizing according to perceptual groupings to forming concepts. Having concepts allows for generalization and, furthermore, lexicalized concepts make possible the acquisition of properties outside of immediate experience, properties that need to be inferred from observable properties. For example, hidden properties such as that one's pet dog has a heart, and unobservable properties such as another person having thoughts and feelings. The lexicalization of concepts is also key to complex reasoning. For example, it makes it possible to talk about things that are not here and now, to hypothesize about things, and to state counterfactuals, such as 'if the defendant were at home at the time of the crime, she could not have been at the crime scene at the same time' (Sloutsky, 2010, p.2).

8.2 Early language acquisition and later development

Many researchers propose that the key motivator for learning language is functional (Bloom, 1993; Snow, 1999; Tomasello, 2004). As social beings, babies want to be able to communicate. It has been shown that children growing up in isolation do not

develop a language, whereas children who grow up in groups, even without a language that is externally available to them, for example due to deafness, create a language to communicate, as a group of deaf children in Nicaragua did (Senghas & Coppola, 2001).

To accomplish the very complex task of learning how to communicate through language, children make use of general cognitive abilities. The role of input is crucial. In contrast to nativist theories of language learning and the claim of the poverty of the stimulus (Chomsky 1980; Pinker 1994) research has shown that the input children get is neither insufficient nor flawed (Tomasello 2003; Cameron-Faulkner et al., 2003) but provides the very material from which children construct a language. This, however, is a complex task that takes time, and it takes a long developmental process for children to become fully proficient language users (Berman, 1997).

8.2.1 What does it mean to know a word?

Learning word meanings may seem like an aha experience, where a person goes from ignorance to knowledge in a flash of insight. While that might be a valid experience of learning a word meaning, it seldom corresponds to learning a word's meaning, in other words, the whole range of the word's possible meanings. In this section, aspects of what it means to know a word are discussed.

Bergelson and Swingley (2012) have shown that infants as young as 6 to 9 months, react differently to words that are frequent in their input, by gazing longer at the picture depicting the word referred to than at a simultaneously presented distractor picture. Linking a word form with a depiction is, however, simple association and does not correspond to what Tomasello calls 'an intersubjectively understood linguistic symbol' (Tomasello, 2001, p. 1120) used to communicate with other people.

Dale (1965) suggests that knowledge about a word lies on a continuum with the following stages. The first stage is when a word has never been encountered and does not exist as a meaningful lexical item in a person's vocabulary. Secondly, a word may be known to a person without having a meaning attached to it. In the third stage, a word may be contextually known, i.e., there is a partial knowledge pertaining to a certain context. In the fourth and final stage, the word meaning is understood and established as a part of a person's vocabulary. In addition, it would also be meaningful to make a distinction between passive and active knowledge. Passive knowledge allows for some understanding of a word meaning, although the child does not yet feel confident enough of its knowledge of the word to use it actively in its own production, i.e., using it intersubjectively according to Tomasello's (2001) definition. Furthermore,

I would add a fifth stage, which could be called the refinement stage – an open-ended process that consist of continuous adjustment and deepening of the word knowledge, fuelled by additional encyclopaedic knowledge and life experience.

When young children learn the meanings of words, we may encounter both under- and overextensions in their use of the words. Underextension is when children use a category label, for example *dog*, only referring to a subset of the (adult) category (Bloom, 1973; Reich 1976), for example only to large dogs (Clark, 1993). Overextensions, which are more common, take place when children use a category label to refer to the adult category, but extend it to also include other, perceptually similar categories, such as not only calling DOGS *dog*, but also referring to sheep and goats as *dogs* (Clark, 1993). We do not expect small children to grasp the full meaning potential of a word-meaning pairing, realizing that understanding grows with cognitive maturation and experience, including both word and world knowledge. This is equally true for older children and adolescents, even adults. For adults, this may be most evident when venturing out into new territories of knowledge (Miller & Gildea, 1987). Partial knowledge is sometimes reflected in production errors, but these often go unnoticed. Conceivably, it is fair to say that people's semantic knowledge of a word is always partial to a certain degree since new uses might emerge at different points in time. However, as we encounter a word in different uses in a variety of contexts, our knowledge about its meaning expands. From a cognitive linguistic viewpoint, it is indeed impossible to reach a full understanding of a word, since word meanings are not fixed, but defined by context and emerging at the specific times of use (Paradis, 2003).

How cognitively natural this process is for us language users can be illustrated by a vocabulary study with eighth graders performed by Nagy et al. (1985) demonstrating learning through a reading experiment. They were able to show that eighth graders, when confronted with unfamiliar words in natural (written) context, were learning the meaning of new words after only one, or a small number of exposures. While finding that learning a word's meaning can take place after reading it only once, they coincidentally acknowledge that learning word meanings from context happens through the cumulative effect and that these words may already have been partially known and thus conclude that the learning of new word meanings from context is a continuous process (Nagy et al., 1985).

8.2.2 What words are learned

The vocabulary of young children primarily consists of words representing people, observable concrete objects and actions that are common in their own lives and surroundings. *Mom*, *dad*, *ball*, *dog*, *eat*, *walk*, etc. With more experience of the world,

and cognitive development, the vocabulary expands. This being a continuous process of biological maturation and increased world knowledge, entering school to learn how to read and write, and following a school curriculum, both furthers and demands the development of a wider and deeper vocabulary. This includes understanding and producing more and more abstract concepts, such as abstract nouns (*time, society, idea*) and cognitive verbs (*think*, *believe*, *know*), understanding and being able to express different modalities, such as likelihood ('It could happen that'), necessity ('You need to be here'), probability ('He might not come to the party'), and obligation ('You must invite him'). Most important to this study, however, is the understanding of polysemy, vagueness, and the context-sensitivity of word meanings.

8.2.3   Early word learning versus later vocabulary development

It lies in the nature of the process that there are qualitative differences between early and later vocabulary development. Infants and small children learn and construct their first language(s) from the ground up. In contrast, later language development consists of extending an already existing vocabulary, deepening the understanding of already known word meanings and concepts, and continuously modifying word meanings and concepts as they need to be adjusted in relation to newly added words or acquired encyclopaedic knowledge. These processes are influenced by internal and external factors, just as the learning process is for young children. The factors as such, however, change with age. One example is input. Externally, there is more variation in learning environments, older children and adolescents move in bigger and more diverse circles. There are more sources for language learning. Not only is there the explicit instruction as part of the obligatory curriculum, but from grade four, when children are developing into proficient readers, written language comes to be an important source for vocabulary growth. All these factors also lead to greater individual linguistic style, since in addition to older children being exposed to more input, their language is also becoming more specialized, due to variation in curriculums and personal interests (Nippold, 1995).

As children get older, changes in language development are less obvious and happen at a slower pace, but qualitative changes keep unfolding through the teenage years and adult life (Nippold, 1993, 1995). Cognitively, older children have the capacity for abstract reasoning, social perspective taking, and they develop a meta-linguistic competence. In the preface to *Language Development across Childhood and Adolescence* (Berman, 2004) Nippold (2004) lists cognitive development, education, and socialization as the driving factors for later linguistic attainments. However, these later achievements happen gradually, and the changes reflected in production are subtle,

mirroring different nuances rather than expressing completely new meanings (Berman, 2008; Ravid & Zilberbuch, 2003; Scott, 1988).

8.2.4   Early noun and adjective learning

The focus of this dissertation is on adjective and noun combinations and how their uses develop during the school years. However, I also provide an overview of some research performed concerning young children's adjective and noun acquisition. This is of importance because at the same time as young children seem to learn nouns more easily than verbs, the learning curve for adjectives differs further, as adjectives are learned later and seem more difficult, since children make more mistakes in both adjective comprehension and use. With the purpose of finding out what aspects of adjective learning make the process more difficult and prolonged, researchers have conducted several studies investigating early adjective acquisition from different angles. Keeping in mind the long developmental route of language development, some of the aspects that are difficult at a young age may well, as stated earlier, have a degree of complexity to affect adjective usage even during the school years.

8.2.5   Development of adjective and noun combinations

As established before, the basic view in this thesis is that meanings are context-dependent and crystallize on the actual occasion of use (Paradis, 2005). In the case of adjectives, this process of creating meaning (both in production and interpretation) is further complicated by the conceptual integration of the adjective with the noun. The function of the adjective is to modify, describe, or restrict noun meanings. The nominal meaning thereby also defines the adjective meaning. This is not only true for dimensional adjectives, where for example the meaning of *big* is different depending on the size of the referent (e.g., *big ant* vs*. big elephant*), but also for non-scalar adjectives: a *spotted giraffe* hardly evokes the same mental image of SPOTTED as a *spotted ladybird*, for example. A *dead mouse* is quite different from the metaphorical *dead computer*. Several studies (e.g., Braine, 1976; Ninio, 2004; Tomasello, 1992) have shown that young children's production of spontaneous attributive adjective-noun combinations emerges relatively late compared with other types of constructions. One reasonable explanation would be that young children are not sufficiently cognitively mature to process the conceptual integration that needs to happen to interpret the combined adjective-noun meaning. There are, however, studies showing that (while still far from adult understanding and use), children from the age of 5 are starting to show the ability to integrate conventional word meanings with world knowledge (Tribushinina, 2013).

Suggesting that children do indeed have difficulty learning the attributive adjective noun relation because it involves a two-step logical-semantic integration process of integrating both noun and adjective meaning, Ninio (2004) conducted two experiments with young Hebrew children to test this hypothesis. In the first experiment 170 children aged 1;6 to 4;4 participated. The task was to point out the correct referent, choosing from four photos picturing two objects crossed with two attributes, e.g., a big teddy, a small teddy, a big clock, and a small clock. Only highly familiar adjective-noun combinations were selected for the stimuli. The results show that even the oldest children had difficulties in interpreting adjective-noun combinations. The analysis of the responses and of self-corrections indicates that especially the youngest children completely ignored the adjective and made their choice relying on the noun only. In the second experiment with 30 participants between the ages of 1;9 and 4;11, two simpler conditions showing only two choices were added. The results showed that the children generally, and particularly the children of the lowest ranking third, performed significantly better in the 2-picture condition. Taken together, the studies show that, while 4-year-olds can still have difficulties in interpreting common adjective-noun combinations, even the smallest children participating possessed a basic adjective vocabulary. These results suggest that the difficulty may not lie in learning adjective meanings per se, but in the integration of the adjective meaning with the noun meaning. The authors propose that the interpretation of adjective-noun meanings is complicated because it involves a two-step process, namely, first identifying the kind of objects the noun refers to and secondly restricting the reference to the object(s) having the correct attribute – a process that is cognitively demanding for young children but gets easier and eventually becomes automatized.

According to Sandhofer and Smith (2007), there are three types of evidence suggesting that nouns are easier to learn than adjectives. First, while nouns dominate the vocabulary of young children, adjectives are rare (Nelson, 1973; Gentner, 1978; Dromi, 1987; Gasser & Smith, 1998; Mintz & Gleitman, 2002). Secondly, the patterns of errors that children make show that these are very uncommon in both the comprehension and the production of nouns (Huttenlocher & Smiley, 1987; Naigles & Gelman, 1995), while studies show that comprehension errors of adjective meanings are common, in 3-, 4-, and 5-year-old children (Carey, 1982; Smith & Sera, 1992). Third, artificial word learning studies generate a range of different results. In some experiments, very young children (as young as 13 months), are able to learn count nouns and even generalize those to category members (Heibeck & Markman, 1987; Bloom, 2000), and a study by Waxman & Booth (2001) shows children as young as 14 months to be able to map properties to an object when the object is presented in an adjectival context. There are, however, many other studies where much older pre-school

children (i.e., 2, 3, and 4 years old) have trouble interpreting adjectival meanings and sometimes use them to name a whole object instead (Au & Markman, 1987; Au & Laframboise, 1990; Imai & Gentner, 1997). It is suggested by a number of researchers that under certain conditions, children are able to understand and learn adjectival meanings from a very young age. The adjective meanings need to be presented to them in the right way in the right context, providing syntactical and contextual cues, usually in a carefully prepared laboratory setting (Hall, Waxman & Hurwitz 1993; Mintz, 2005; Sandhofer & Smith, 2007; Waxman & Booth, 2001). However, longitudinal studies on early adjective acquisition in natural settings have shown that adjective use is infrequent both in parental input and in child language production. Around the age of 20 months children start learning adjectives at a high pace, reaching a plateau around the age of three (Tribushinina et al., 2015).

Sandhofer & Smith (2007) performed two studies investigating the relation between young children's knowledge about nouns and their acquisition of adjectives. The first study examined parental input in natural settings and revealed that the kind of stimuli provided in controlled experiment rarely figures in parent's spontaneous speech with their young children. In parental speech, the syntactical framing of adjectives was often ambiguous, making adjectival meanings easily mistakable with noun meanings. For example, parents sometimes left out the noun and only used the adjective in combination with an article, saying 'This is the red' Or 'Here is a blue' (Sandhofer & Smith, 2007, p. 242). The second study, comprising two experiments, was designed to investigate the role of syntactic cues. In the first experiment, children took part in a training study designed to teach them colour terms without strong syntactic cues using the ambiguous sentence frames that parents had used: 'this is a __ one', 'this is __', and the adjective alone (e.g., 'red'). The second experiment was designed providing strong cues to indicate the adjectival status of the word. The experimenter asked for each colour by saying 'Can you give me the red cup? Find the red cup.' The interesting finding was that older children with more nouns in their productive vocabulary were more likely to benefit from strong syntactic cues, while younger children with a smaller number of nouns in their productive vocabulary learned more colour terms without strong syntactic cues. The authors suggest that learning adjectives in the real world follows a curvilinear trend, it being easier for small children with few nouns in their vocabulary because syntactic ambiguity does not confuse them. There is evidence suggesting that children learn to attend to linguistic cues as part of the general word learning process (Bloom, 2000; Smith et al., 2002). It would therefore be reasonable if the learning of adjectival meaning were harder for children with a higher sensitivity to syntactic cues and more nouns in their vocabulary, the process however becoming easier

again at a later stage of language development, when the learner is able to make even more subtle distinctions of syntactic and contextual cues.

There is further evidence that the noun matters for the learning of adjectives. For example, familiarity with the specific object or the object category has shown to be a facilitating factor, and in line with that, it makes sense that underspecified nouns, such as for example 'thing' or 'one', complicate acquisition (Hall, Waxman, & Hurwitz, 1993; Klibanoff & Waxman, 1998; Mintz, 2005; Mintz & Gleitman, 2002; Waxman & Klibanoff, 2000).

8.2.6   Boundedness and gradeability

Just as for nominal meanings, the configuration plays an important part in how we conceptualize and comprehend adjectival meanings. There are two types of gradable adjective meanings: meanings that have a boundary and those that are not associated with a boundary. Gradable adjectives are combinable with (unbounded) scalar degree modifiers such as *very*, *fairly*, and *terribly*, whereas bounded adjective meanings combine with totality modifiers such as *completely*, *absolutely*, and *almost* (cf. section 4.2) (Paradis, 1997, 2001, 2008).

Experiments performed by Syrett, Kennedy, and Lidz (2010) have shown that children are sensitive to configurations of scalarity at a very young age (30 months) and that they make use of adverb modifiers to interpret novel adjectives. When unknown nonsense-adjectives were modified by scalar modifiers, for example *very*, the children were more likely to attach it to a gradable meaning to do, for example, with tallness (e.g., *a tall jar*), but when the adjective was preceded by a totality modifier, such as *completely*, they were more likely to attach it to a non-gradable meaning (e.g., a completely clear jar). Tribushinina (2017) performed a modified, cross-linguistic version of Syrett and Lidz's study. The results showed that children make use of degree markers to determine adjective gradeability only as long as the degree markers function as reliable cues, without semantic, morphological, or phonological ambiguities.

Tribushinina (2012) analysed speech samples from 2- to 7-year-old Dutch children with the purpose of determining when language production starts reflecting semantic differences between non-gradable and different kinds of gradable adjectives. This data reveals that children as young as 2 years are sensitive to gradeability and already make use of degree markers such as comparatives, superlatives, and degree adverbs to modify gradable, but not non-gradable adjective meanings. While errors were few, they persisted at least until the age of six, which coincides with the time when the proportion of degree adverbs reaches adult level. The error patterns suggest that despite an early

sensitivity, the acquisition of gradeability is still in development when children begin primary school. A comprehension study with 5-year-old children (Tribushinina, 2014) shows that while some children understand the semantics of the modifiers 'too' and 'a bit' at this age, others are still not able to discern the meanings of adjectives combined with these degree adverbs. Furthermore, the results reveal that poor comprehenders process sentences with 'too' faster than the same sentences with 'a bit', indicating that diminishers may have a higher conceptual complexity.

8.2.7 Constructional use

In Swedish, as in English, adjectives may be used to modify a nominal meaning both attributively (*a red car*) and predicatively (*the car is red*). The two different structures construe two different form-meaning pairings (Goldberg, 2006). A simple recapitulation of the more detailed account in section 4.3 is that the attributive adjective mainly expresses meanings with the functions of classifying, defining, or describing an entity and thereby often has a restrictive function. Diesendruck et al. (2006) performed experiments showing that 3- and 4-year-old children already have some understanding about attributive adjectives having a restrictive function on the referent. Adjectives in predicative position have a descriptive function and often communicate properties that are more newsworthy than those in attributive position (Paradis et al., 2015). According to Bolinger (1967) it can also be argued that attributive adjectives express properties that are more time-stable, whereas adjectives in predicative position express meanings that are more transient (e.g., *my crazy friend* vs. *my friend is crazy*, cf. section 4.3 where this is discussed in more depth).

In an early study, Nelson (1976) analysed spontaneous speech samples from children at 24 and 30 months, with regard to attributive and predicative meaning pairings, looking both at function and semantic properties like time-stability and domains. Her results reveal that younger children predominantly use adjectives in predicative position and that they mainly express meanings to do with changing states of objects (e.g., going from clean to dirty). The results from 30-month-old children revealed a development: in addition to predicative uses of adjectives, adjectives were used attributively to subdivide classes or to specify specific objects within classes, on the basis of properties that usually are more time-stable, such as size. Progression was measured against mean length of utterance (MLU) and showed that as attributive uses increased, predicate uses decreased. Furthermore, the analysis revealed that the meanings expressed by adjectives used attributively and predicatively were drawn from different domains. Predicative adjectives were mainly used to comment on object and animate STATES, whereas DESCRIPTIVE and EVALUATIVE properties were used attributively for classification,

identification, and specification of time-stable properties. In summary, the results of this study show that 2.5-year-old children are already making use of the constructional means to express different meanings.

In the same vein, with the objective of finding out whether the time-stability of properties affects how children use adjectives attributively or predicatively and if the uses are related to domains from which the meanings are drawn, Saylor (2000) analysed speech from three caregivers and their children between two and five years. Interestingly, in this data set, age did not turn out to be a factor, as the results from the child data did not show any age-related differences, thus revealing no developmental aspects. Apart from that, Saylor's study confirmed Nelson's (1976) results, showing that children (and adults) used adjectives expressing time-stable and time-unstable meanings in different constructions: time-stable meaning most often preceded the noun, whereas time-unstable were mostly used predicatively. SIZE adjectives were the most common by far in the children's speech, followed by adjectives from the domains of HUMAN PROPENSITY and PHYSICAL PROPERTY, but meanings to do with VALUEs, COLOUR, and AGE were also represented in all age groups. Context determines whether the adjective expresses a time-stable or unstable meaning, but according to Saylor, meanings representing HUMAN PROPENSITY and PHYSICAL PROPERTY most often express less time-stable meanings, than properties from the domains of AGE, SIZE, and COLOUR. Properties having to do with HUMAN PROPENSITY and PHYSICAL PROPERTY were predominantly time-unstable and mostly used predicatively, whereas properties expressing AGE, SIZE, and COLOUR generally expressed time-stable meanings, modifying the noun attributively. The patterns were the same for both the children and their caregivers.

8.2.8   Domains, order of acquisition, and the role of input

Domains are the means by which we organize concepts – they are systems of related concepts and in order to understand the individual concepts, we need to have an understanding of the domains as a whole (Fillmore & Atkins, 1992; Goldberg, 2006, Gärdenfors & Löhndorf, 2013). Gärdenfors (2014) proposes that children do not only learn words belonging to basic domains first, but furthermore, that when the young language learner has the cognitive maturity to grasp the meaning of a specific concept, the child quickly learns other, related concepts from the same domain. For example, COLOUR terms are among the first adjective meanings children express and they have little difficulty learning new and even unusual colour terms, such as *chartreuse* and *mauve*; showing that they grasp the perceptually salient concept of colour at an early age. Consequently, acquiring new colour terms is about mapping a new word to an

already familiar domain, namely, colour. However, if the child encounters meanings from a more abstract or complex domain, for example terms such as *inflation* or *mortgage* from the domain of FINANCIAL TRANSACTIONS, representing concepts the child has not yet experienced and is not yet cognitively mature enough to grasp, learning will not take place, since these concepts are not yet within the child's semantic reach.

De Geer et al. (2018) studied antonym production in 3- and 5-year-olds with regard to semantic domains and confirmed Gärdenfors' hypothesis that once a child has learned a concept from one domain, other words from the same domain follow closely. Furthermore, their results showed that concepts from perceptual domains (e.g., hot-cold, hard-soft) preceded the use of concepts from more abstract domains (e.g., high-low, deep-shallow). The use of concepts from the more abstract domains was rare even among the 5-year-old children.

Blackwell (2005) investigated the role of input in the acquisition of adjectives, focusing on input frequency, syntactic diversity, and noun-type variety and how these properties may affect order and age of acquisition. An additional objective was to study the age of acquisition and development of adjectival use from a semantic perspective. Data from two children between the ages of 2;3 and 5;0 and their mothers was analysed. Each utterance was annotated with regard to the adjective and its semantic domain, its syntactic position, and the noun it modified. The results show that all three properties of input frequency, syntactic diversity, and noun-type variety were significantly correlated with order of acquisition. Moreover, adjective frequency and syntactic diversity were significantly correlated with age of acquisition. Furthermore, the semantic analysis of the adjectives and adjective domains revealed that within the age span of 2;3 and 2;11, all the major domains (following Dixon, 1982) were already represented in the children's vocabulary by at least one adjective. *Big*, *little*, *small*, and *tiny* were the adjectives to appear first in the domain of DIMENSION, VALUE was expressed by adjectives such as *good*, *nice*, *wrong*, and *bad*; PHYSICAL PROPERTIES such *hot*, *cold*, *dirty*, *messy*, and *pretty* were part of the early adjective production, and so were meanings representing HUMAN PROPENSITY (e.g., *happy*, *tired*, *crazy*, *afraid*), and a whole range of COLOUR terms. Taking the domain of PHYSICAL PROPERTY as an example of adjective vocabulary development, adjectives appearing within the age span between 3;0 and 3;11 are for example *sticky*, *rough*, *empty*, *round*, *straight*, and *sharp*, to be complemented at the age between 4;0 and 5;0 by adjectives such as *tight*, *loose*, *strong*, *slow*, *quick*, and *fast*. All of the children used more adjectives from the domains of PHYSICAL PROPERTIES and COLOUR than their mothers, while the mothers used more meanings to do with VALUE than the children did.

Tribushinina et al. (2013) performed a cross-linguistic longitudinal study, analysing transcripts of spontaneous child-parent interactions of two Dutch, two German, two French, two Hebrew, and two Turkish speaking children aged 1.8–2.8 years and their caregivers. They argue that this age span is of special interest since there is a significant development and consolidation of the adjective category starting from the age of around 20 months. The main focus of the study is the development of semantic classes in the early adjective lexicon, i.e., the frequency of adjective uses and how these may be influenced by parental input. Not unexpectedly, the results show that children tend to use more adjectives the older they get. There were, however, differences between different semantic categories/domains. Surprisingly, although prior studies (Blackwell, 2005; Saylor, 2000) have shown that adjectives denoting *physical properties* constitute the most frequently used adjective class by young children and the second most frequent class (after evaluative adjectives) used in child-directed speech, the results from this study do not show any age-related increased usage of this particular adjective class. Since this domain includes a wide range of diverse meanings, related to meanings such as taste, smell, sound, temperature, light, and speed, the authors speculate that the size and heterogeneity of the category may obscure the developmental patterns. However, sub-dividing the category would demand a larger sample size to ensure the avoidance of sampling error. In child speech, not surprisingly, more abstract adjective meanings, for example concerning behaviour, conformity, and internal states, were hardly present at all. In contrast, adjective meanings that are more integral in a toddler's life, such as adjectives referring to colour and physical state, spatial and evaluative meanings are used relatively frequently and more and more often through the year this investigation covers. The frequencies of use and the order of emergence of different adjective meanings show that adjective usage is strongly linked to the children's cognitive development. Adjectives of space and colour and physical property terms emerged first, followed shortly afterwards by evaluative terms (these being frequently used by the caregivers), while adjectives from more abstract domains, among them temporal, modal, and behavioural terms, started to show up only towards the end of the year, or not at all. Overall, there is a clear correlation between adjective input from the caregivers and children's use of adjectives. The correlation was stronger the younger the children were, indicating that with age, children will start using adjectives more independently. Analysis of the caregiver's utterances reveals that caregivers' adjective usage changes over time, with regard to adjective meanings and their frequency. These findings are in agreement with the theories of parental scaffolding (Wood et al., 1976) and audience design (Clark & Murphy, 1982), which propose that parents adjust their input to the capacities and interests of the child. Except for a few language-specific trends, the findings of this study are consistent across all five languages.

Participles used as modifiers of nouns, i.e., adjectives derived from verbs, denoting the results of an action or event (e.g., the vase is broken, because someone broke the vase), form a major subclass of adjectives. Morphologically they are derived from verbs and semantically all past participles convey end states. The meanings they express are as diverse as there are domains. Studies have shown that children are attentive to changes of states early in their development and even distinguish between inherent properties of an object and temporary states (Clark, 2002). Kagan (1981) reports that two-year-old children are attentive to natural or ordinary states of things and notice when things deviate from that normal state, for example by having a crack or being broken. They seem to be particularly attentive to changes of states as an effect of an earlier action. These are also the earliest states that children comment on, using participles such as broken, dropped, or spilt (Clark, 1983). These findings are confirmed by data in the CHILDES database (MacWhinney, 2000) ─ containing a multitude of utterances of two-year-old children noticing things being broken, fixed, or even glued, locked, or wiped up (Israel, Johnson, & Brooks, 2000).

8.3 Later adjective development

Recognizing that adjectives are acquired later than nouns and verbs, Ravid and Levie (2010) propose that adjective usage provides a fruitful approach to study later lexical development. With the intention to examine how adjective usage consolidates during the school years and the interrelation with semantic, pragmatic, syntactic factors, they study 252 texts written by 63 Hebrew-speaking children, adolescents and adults. Their view is that later linguistic development is best studied in the context of extended discourse, and they chose to analyse all adjective occurrences in both spoken and written modality, as well as in the two different genres of narrative and expository texts.

Adjectives were classified according to four different categories, constituting what they call the *adjective scale*:

- Core adjectives – these are adjectives matching a list of adjectives produced by young Hebrew children between two and five years, mostly including monosyllabic adjectives, canonical colour terms, basic dimensional adjectives, and some common adjectives with modal function, e.g., *necessary*.

- Resultative participial adjectives, i.e., adjectives based on verb patterns. These are typically acquired by Hebrew children between the ages of 4 to 6 years.

- Adjectives with verbal or nominal patterns, i.e., adjectives sharing their forms with nouns and verbs.

- Denominal adjectives, these are adjectives derived from nouns with a suffix and constitute a productive class in Hebrew.

Furthermore, all adjectives were also analysed with regard to several syntactical categories. Firstly, they were analysed as to whether they were in attributive or predicative position. Secondly, it was noted if they were part of a complex structure, such as conjoining adjectives, or adjective stacking. Thirdly and finally, the analysis concerned internal adjective phrase modification; basic modification such as 'biggest'; adverbial modification such as 'relatively small'; or multiple modifications, such as 'much more unpleasant'. In order to establish a basis for the analysis of adjective distribution, several aspects were measured. Firstly, text size was determined by means of counting words, clauses, and mean clause length. This analysis showed that text length primarily increased in later adolescence and that narrative texts were longer than expository texts. However, while narrative texts contained a higher number of words and clauses, longer clauses were produced in expository texts. Secondly, lexical density was analysed by measuring (on the token level) the number of content words and number of adjectives per clause.

The results show that the number of content words per clause increases with age and that there is a leap between 7th grade (students aged 12–13 years) and 11th grade (students aged 16–17 years). Written texts contained more content words than spoken and expository texts more than narratives; the last effect was most pronounced in the three older groups. The number of adjectives per clause also increases with age. In the two older groups written texts produce more adjectives than spoken and expository texts more than narratives. The main objective of the study was to investigate the use and distribution of adjectives.

Three different analyses were conducted to assess the morpho-semantic development. Firstly, the *mean score* on the *adjective scale* (i.e., of the four different categories in the adjective classification presented above) affirms that the score increases with age, the adult group having a much higher score than the other groups, the mean adult score for written expository texts being 3.47, with 4 being the maximum score. Expository texts generated a higher score in all groups. Secondly, also increasing with age, showing cut-off points both after 4th and 11th grade, is the number of *different* adjective categories, expository texts again generating a higher number than narratives. Thirdly, the modality effect showed that written texts produced more adjectives than spoken texts. The syntactic analyses revealed that attributive uses increased with age; predicative uses were more frequent in narratives and attributive uses were higher in

expository texts. Attributive uses levelled off in narratives from 7th grade but continued to increase in expository texts. With regard to adjectives being part of complex syntactic structures there was only one finding, namely, that conjoined adjectives (e.g., 'daunting and revolting' and 'unwanted and dangerous') were more common in expository texts. The analyses of internal adjective phrase modification did not reveal any age/grade effects or interactions in any of the adjective modification categories; there were however modality effects, as adjectives with advanced modification and adjectives with multiple modifications were more common in written than in spoken texts. Finally, the analysis of internal adjective modification showed no age/grade effects neither, but genre and modality effects were revealed: adjectives with basic modifications were more frequent in narrative texts and also more frequent in spoken than in written texts. On the other hand, adjectives with advanced modification were more common in expository texts and also more common in written than in spoken texts.

In addition to the analyses accounted for above, the authors decided to examine possible gender differences and found the following effects: Girls had higher adjective density and had higher scores on the adjective scale; syntactically, girls used adjectives in attributive position more often than boys and made more use of complex structures.

To summarize, the results of this study revealed that just as texts become longer and more lexically dense over the school years and into adulthood, so does adjective usage grow in number, diversity, and complexity. The highest number, the greatest diversity and the most advanced uses of adjectives occurred in written expository texts – at the same time it may be pertinent to point out that all analyses suggest that core adjectives constitute the dominant class in all groups.

8.4 Later noun development

In his study of grammatical structures in Grades 4, 8, and 12, Hunt (1964) was able to confirm his hypothesis that increased clause length could be explained by an augmented use of noun modifiers. He found that writers in Grade 4 mostly used unmodified nouns, at the same time as they made the most frequent use of personal pronouns. This correlation may be explained by younger children necessitating more personal pronouns in order to keep track of reference across their higher number of shorter clauses (Hunt, 1965). In contrast, students in Grades 8 and 12 generally used fewer personal pronouns, but considerably more modifiers, in the form of adjectives, genitives, prepositional phrases, infinitives, and present and past participles. Older students, in other words, had developed the ability to express themselves more succinctly, by integrating more information in fewer words and clauses. The following

example provides a good illustration of the phenomenon. Where a young student writes 'Moby Dick was a whale. The whale was very strong.', an older student has the skill to condense this information into 'Moby Dick was a very strong whale.' (Hunt, 1965).

Studying English native speakers Nippold et al. (2005) and Sun and Nippold (2012) investigated the development of the use of abstract nouns during the school years (and beyond) in written persuasive texts and narratives. Both studies, the first one analysing persuasive texts by 11-, 17-, and 24-year-old students and the second study analysing narratives by 11-, 14-, and 17-year-old writers, show that the use of abstract nouns increases in every age group.

Motivated by the view of the lexicon playing a crucial role for language development, Ravid (2006) performed a study on the development of noun usage during the school years. Reflecting the view that the development of linguistic and encyclopaedic knowledge goes hand in hand, the basic assumption is that as children grow older, their real-world knowledge and schooling, along with their cognitive development, allows them to understand and express more complex and abstract ideas, which will show in the use of more and more abstract nouns. The data consists of 320 texts, written by 80 Hebrew-speaking children and adolescents and an adult control group. Each person produced both a spoken and a written narrative and a spoken and a written expository text. In order to examine the development of noun usage, the Noun Scale is introduced as an evaluation tool. The Noun Scale classifies nouns into ten different categories of abstraction, shown in Table 8.1 (Ravid, 2006).

Table 8.1
Nouns in ten different categories of abstraction (Ravid, 2006)

Category	Examples
1. Concrete nouns	car, cat, house
2. Proper nouns	Michael, McDonald's
3. Collective & Location	orchestra, library
4. Social role nouns	queen, teacher, mother
5. Generic nouns	people, everybody, stuff
6. Temporal nouns	minute, hour, month
7. Event nouns	party, meeting
8. Imaginable abstract nouns	blows, kicks, scratch
9. Abstract nouns	authority, character, issue
10. Derived abstract nominals	annoyance, behaviour

All nouns occurring in the texts were annotated according to the Noun Scale and each text received a Noun Scale score, corresponding to the average score from all nouns in a text. The results showed that the Noun Scale score was rising with age. Further, written texts have a higher score than spoken texts and expository texts produce a higher score than narratives. The texts were additionally analysed for nominal density, the results showing the same pattern as the Noun Scale analysis: texts got nominally denser with rising age. Written texts have a higher density than spoken texts and expository texts are nominally denser than narratives. The predictions were thus corroborated by the study and the Noun Scale was confirmed as a useful tool to investigate the level of abstraction of nominal meanings.

Abstract nouns also play a significant role on a discourse level. Ravid and Cahana-Amitay (2005) propose that the use of verb- and adjective-derived nouns to express predicative content is a way to take a more objective, distanced, and generic stance, for example, when describing events that the writers themselves had been a part of. These de-verbal and de-adjectival nouns, such as *purchase*, *activity*, and *darkness*, express meanings that would correspond to 2nd and 3rd order nouns in the LOC model applied to the material in this thesis. Ravid and Cahana-Amitay (2005) predict that the ability to express predicative meanings with nouns is a skill acquired only in the later stages of cognitive and linguistic development.

They perform a study using spoken and written Hebrew personal event narratives from four age groups: grade school, junior high school, high school, and adults. The analysis of verb- and adjective-derived nouns does indeed show that their usage undergoes significant quantitative as well as qualitative changes. While verb- and adjective-derived nouns are extremely rare in the younger age groups, with age and schooling such meanings are increasingly expressed with nominal means, instead of the prototypical verbal choice. A qualitative analysis reveals a usage that becomes more diverse and specific, while occurring in more and more complex and diverse syntactic configurations. These skills, which develop relatively late, from adolescence and during adulthood, permit the language user to purposively alternate between predicative and nominal viewpoints, to present an event from different perspectives, and to adopt a more objective stance.

Another study performed by Ravid and Berman (2010) examines the development of noun phrase complexity during the school years. While the development of noun phrase complexity may be identified by the number of noun phrases in a text and by the number of words in each noun phrase, the authors take the stance that complexity is also reflected in the semantic complexity of the head noun and further by the quantity and variety of modifiers such as quantifiers, adjectives, prepositional phrases, and relative clauses attached to a given head noun, which add to the syntactic depth by the

number of nodes that the noun phrase dominates. In this study, the noun phrases in texts produced by 96 Hebrew- and English-speaking participants with 12 participants each attending 4th grade, 7th grade, 11th grade, and university students' writings were analysed according to five criteria: First, noun phrase length was measured by the number of words. Secondly, the semantic complexity of the head noun was categorized into four groups by the following semantic criteria:

- Concrete objects

- Categorical nouns and locations

- Non-abstract, high-register, rare nouns

- Low frequency non-imaginable and abstract derivationally complex nouns.

Thirdly, the number of modifiers within each noun phrase was counted and their semantical and morphological make-up was analysed, without taking syntactical factors into account. Next, syntactic depth was determined by the number of complex governed nodes of noun phrases. And finally, syntactic variability was established by determining the different types of noun-phrase-modifying categories.

The following results were observed. The length of the noun phrase increased with age, the adults differing significantly from all the other age groups. From high school onwards, the noun phrases in written texts were longer than in spoken discourse. The semantic analysis of the noun phrase head showed that these became increasingly abstract with age, every age group differing from the one that preceded it. Expository texts generated a higher number of abstract nouns than narrative texts. While there was no difference between spoken and written narratives, written expository texts showed higher abstraction than spoken expository texts. The third analysis showed an increase in the number and quality of noun phrase modifiers, the high school students differing from the two younger age groups and the university students, in turn, differing from the high school students. Expository texts generated a higher number of noun phrase modifiers than narratives. The results on syntactic depth revealed the same pattern, i.e., depth increased with age. The two younger age groups clustered together, while high school students differed from them, and university students differed from the high school students. Again, expository texts scored higher than narrative texts, and in both genres, written texts scored higher than spoken texts. Finally, the analysis of syntactic variability also showed an increase with age, here the group of university students differing from all the younger groups. Expository texts scored higher than narratives and written texts higher than spoken. All analyses taken together, three major patterns emerged: noun phrase complexity goes hand in hand with clausal complexity, both being most pronounced in late adolescence. Secondly, interacting with the trend above,

were discourse and modality, written expository texts being syntactically more complex than spoken and more complex than narratives in both modalities — also a development most pronounced from high school and up. Finally, the cross-linguistic analysis revealed that Hebrew texts had a higher noun phrase complexity than English texts.

8.5 Metaphor development

The 1980's and 1990's generated an abundant number of studies on metaphor development within the cognitive framework (Szokolszky, 2019). It seems reasonable to assume that Lakoff and Johnson's *Metaphors We Live By* (1980) not only fuelled the interest in metaphor theory in general but also the interest in the developmental perspective. The majority of studies focused on metaphor comprehension (e.g., Baldwin, Luce & Readence, 1982; Broderick, 1991; Cameron, 1996; Evans & Gamble, 1988; Nippold, Leonard & Kail, 1984; Schecter & Broughton, 1991; Siltanen, 1989, 1990; Vosniadou, 1987; Wales & Coffrey, 1986; Winner, 1997). The dominant view before these studies was that metaphor understanding and production were not cognitively available to pre-school children. Theoretical (e.g., how metaphor is defined) and methodological differences (e.g., using 'adult' metaphors when testing children), or type and amount of context, generated somewhat inconsistent results. However, when the experiments were built on word and world knowledge adapted to the children's age, results showed that even relatively small children, that is children at the age of 4, were able to interpret metaphorical expressions without any difficulty, with development continuing until late childhood (Vosniadou, 1987). In a more recent study, Pouscoulous and Tomasello (2020) used a behavioural choice paradigm to investigate metaphor comprehension at the age of 3. Instead of being asked to explain or paraphrase metaphorical expressions, the children were asked to pick out one of two objects, referred to by a metaphor, e.g., a tower with a pointy roof was referred to as 'the tower with the hat'. The results showed that children as young as 3 years old were able to comprehend novel metaphors when they were based on action measures instead of relying on metalinguistic responses (Pouscoulous & Tomasello, 2020). However, while this study shows that small children indeed make use of comparison, the construal on which metaphor is based, the comparison of two concrete entities (i.e., pointed roof and hat) is strictly speaking not a metaphor — a metaphor being a comparison between a concrete and an abstract domain).

A prerequisite for grasping a metaphor is an encyclopaedical understanding of both the Source and the Target domains, or in the terminology used in the majority of developmental studies, the Topic and Vehicle domains. If a child lacks knowledge or

only has a fuzzy comprehension of one of the domains, understanding the relationship is impeded. Vosniadou (1987), suggests that insufficient knowledge of the Target domain is more obstructive than poor knowledge of the Source domain. Keil (1986, 1989) investigated metaphor comprehension of children between the ages of 5 and 9, using metaphorical mappings between eight different pairs of conceptual domains. His results suggest that the understanding of metaphors expands domain by domain and 'as a function of the richness of knowledge in the two domains that are juxtaposed in metaphor' (Keil, 1986, p. 73). Keil's theory is in line with Gärdenfors' (2014) theory about children's adjective acquisition proceeding domain by domain. Consequently, in this line of thinking, young children may understand metaphors as long as they understand the meaning of both Source and Target domain, but they undoubtedly struggle with metaphors where the conceptual meaning of any of the domains is unclear (Gentner, 1983; Nippold et al., 1984). Siltanen's research (1990) shows that with growing age, children are able to establish a greater number of links between the Source and Target domain. This capacity should give them both a deeper understanding of some metaphors and allow them to understand increasingly complex metaphors.

While domain knowledge is crucial for metaphor comprehension, other aspects, such as the frequency and complexity of a metaphor, are also important, as well as the context it occurs in (Keil, 1986). Cameron (1996) investigates the significance of discourse context in helping to focus on the relevant domain knowledge. She defines discourse context not only as the immediate textual context, but also the situation in which it occurs, the participants involved, and the goals of those participants. Her study, which was performed in a school setting, not only confirmed the importance of context for the understanding of metaphor, but also pointed to a set of skills that metaphor comprehension requires, namely:

- negotiating the appropriately rich meaning of metaphorical language by finding a resolution of incongruity, through the mediation of others or through internal mediation;

- automatically accessing stored contextualized metaphorical language and metaphorical meanings;

- knowing when it is appropriate to use metaphor or to interpret metaphorically;

- achieving conceptual and affective goals for oneself, or interpersonally, through metaphor (Cameron, 1996, p. 61).

8.5.1 Metaphor production

To my knowledge, there exists only one single developmental elicitation study for metaphor production (Dent & Rosenberg, 1990). They showed 30 participants aged 5, 7, and 10 years, and an adult control group, pairs of objects which they were asked to describe. Half the group were presented with standard objects, such as a wrinkled apple and a wrinkled face and the other half were presented with visual metaphors in the form of compound objects, such as a wrinkled apple with a hat and a wrinkled face with stem and leaves at the top. The results showed that when describing compound objects, 7-year-old children used metaphors as often as adults. When describing standard objects, the use of metaphors increased between the ages of 5 and 10 and between 10-year-olds and adults.

Granted that there are methodological difficulties in the study of metaphor comprehension, systematically studying metaphor production is even more complicated. Studies exploring metaphor production are significantly fewer than investigations of metaphor comprehension and all of them (except the one mentioned above) study natural language, in contrast to the experimental settings of comprehension studies. While expressions of metaphorical character have been observed in small children (e.g., Billow, 1981; Chukovsky, 1968; Dent-Read, 1997; Szokolszky, 2006; Vosniadou, 1987; Winner, 1979), there has been disagreement as to whether these are 'real metaphors' or 'child metaphors' and what conditions a metaphor produced by a child must fulfil in order to be a 'real metaphor'. The discussion was dominated by two issues. Firstly, there was the matter of differentiating between metaphor and pretend play, where children may use one object to stand for another, e.g., using a block as a horse (Lillard, 1993). And secondly, the concern of knowing whether a child violated the convention of reference by naming something by a different name from the conventional one (e.g., as an overextension or by mistake), or whether a cross domain comparison was involved. For example, if a child called a car roof box a backpack because it did not know its proper name it is an overextension, but if a child called the car roof box a backpack as a comparison between a person and a car carrying something, a cross-domain comparison has taken place. Furthermore, if one could establish that a cross-domain comparison did indeed take place, there remained the question of whether the child was aware of it or not. The general opinion seems to have been that only cases in which the child intentionally made a cross-domain comparison would the metaphor be categorized as a 'real metaphor'. Opinions differed on children's ability to produce 'real metaphors'. Some researchers (e.g., Chukovsky, 1968) reckoned that children's metaphor-like expressions are chance events, or due to errors of categorization, while others (e.g., Billow, 1981; Winner 1979, 1997) judged them as true metaphors involving intentional cross-domain comparisons.

The issue of differentiating between pretend utterances and metaphorical expressions has been addressed by several researchers (e.g., Dent-Read, 1997; Szokolszky, 2019; Vosniadou, 1987) and the different functions of the two types of expressions have been identified. When children pretend in play, they use objects as props and any utterances about them are fictional and pertain to the prop within the specific play session. Metaphors are used to observe or state something pertaining to the real nature of an object, activity, or situation. So, while the purpose of pretend play is to create an imaginary world, a metaphor provides a comment on the real world (Dent-Read, 1997). In consequence, pretend utterances do not make any sense outside the play session, whereas metaphors keep their meanings outside of a pretend situation (Vosniadou, 1987). Although pretend and metaphor are conceptually and functionally different activities, it may sometimes be difficult to distinguish between them in empirical studies (Dent-Read, 1997; Szokolszky, 2019; Vosniadou, 1987).

Dent-Read (1997) performed a longitudinal diary study of her child's spontaneous metaphor production from the time that the child started to speak. The first metaphorical expression occurred only 8 months after the first utterances. The following criteria had to be met in order for an utterance to be classified as metaphorical (Dent-Read, 1997, p. 272):

The utterance links different kinds of objects or events by calling one thing another or likening one thing to another;

- a sensible and specific ground (i.e., resemblance is clear);

- the utterance is used once or twice, that is, a novel metaphor (i.e., it does not become a new lexical item);

- literal names for the referents or other evidence of literal knowledge of the topic and the vehicle in action are available; and

- the speaker has not used the term in an overextended way previously to refer to the topic object.

Dent-Read's research is grounded in the ecological framework of metaphor development (see also section 7.1.1 on this approach to metaphor). In the ecological approach, perception rather than symbolic representation is the foundation of knowledge. Cognitive development in the ecological framework is based on knowing through perception and interaction with the environment and other people, rather than on stored knowledge (Dent-Read, 1997; Szokolszky, 2019). Even small children are apt at flexible and dynamical context dependent categorization and the perceptual systems identify relationships between language and the world and (Szokolszky, 2019). As a result, they develop the capacity to recognize likeness across different kinds of

things, for example between snakes and winding roads (Dent-Read, 1997). The process goes both ways, though, since linguistic competence facilitates the discovery of new relationships. Szokolszky (2019, p. 23) expressed it this way: 'Language use emerges from the interactive matrix of individuals who continuously educate each other's attention to perceived structures in the world.' While the focus of the ecological approach lies on perception, it is acknowledged that knowledge also consists of mental representations (Dent-Read, 1997). If, however, as Dent-Read (1997, p. 256) also states, 'one takes perceiving as the starting point of knowing, rather than symbolic representations, then definitions of cognitive activities and expectations about the development of such abilities differ radically from those of the symbolic approach.' Early metaphor comprehension and production are considered possible, even likely, since both language and knowing are considered perceptual phenomena, as is metaphor in that it is about perceiving likeness across categories. Metaphor understanding and production advance with age, as the capacity for differentiation increases with experience and the same metaphorical expressions can be used both in simple and superficial ways (e.g., being only about appearance) and in deeper and more complex ways (Dent-Read. 1997).

8.6 Metonymy development

Until quite recently, metonymy development has received very little attention in the study of language development, resulting in a gap of knowledge concerning children's understanding and production of metonyms (Rundblad & Annaz, 2010; Falkum, 2019; Falkum et al., 2017). However, in the few studies that have been performed, it is shown that metonymy comprehension and production is present from an early age and continues to develop in childhood (Falkum et al., 2017; Köder & Falkum, 2020; Nerlich et al., 1999; Rundblad & Annaz, 2010; Van Herwegen, Dimitriouc, & Rundblad, 2013).

Nerlich et al. (1999) performed a comprehension study with children from 2 to 5 years. The children listened to short stories and were then shown two pictures, one with a literal meaning and one with a metonymical meaning and were asked to choose the picture that described the events in the story. The results showed improvement with age, as children aged 4 to 5 years had better metonymy comprehension than 2- to 3-year-old children. All children performed better in instances where the metonymic relation had been explicit in the story. Rundblad and Annaz (2010) studied the development of metaphor and metonymy comprehension from the age of 5 into adulthood, using picture stories and a verbal comprehension task. Both metaphor and

metonym comprehension increased with age. However, metonym comprehension was higher at all ages, suggesting that the construal of metonymy is cognitively more basic than the construal of metaphor. Typically developing participants in another metaphor/metonym comprehension study (Van Herwegen et al., 2013) confirmed that the comprehension of figurative language improved with age.

Two recent studies have combined different methods to investigate both the comprehension and the production of metonymy development. Falkum et al. (2017), focusing on referential metonymy, performed one comprehension and two elicitation tasks with children aged between 3 and 5 and a group of adults. The comprehension task consisted of a forced-choice picture task. All metonyms were novel metonyms, that is, conventional metonyms were avoided. The children were first shown one picture with a scenario that was described to them, e.g. 'This story is about these two girls. They are standing outside talking before going home from work. After they have been talking for a while, the helmet gets on her bike and rides home' (Falkum et al., 2017, p. 6). Subsequently, the children were presented with three pictures, one depicting a woman wearing a helmet with a bike (metonymical referent), one showing a woman without a helmet with a bike (distractor), and one picture depicting only the bike (literal reading). The children were asked to pick out the picture that corresponded to the description. In the literal condition, the referent was a whole object present in the scenario, e.g., a bright jacket placed on a chair. The comprehension study revealed surprising results. The 3-year-old group showed some understanding of novel metonyms, but interestingly, many of the older children performed less well. However, the older children who did interpret metonyms correctly were more adept in reasoning about them than the younger children. No children performed at the same level as the adults. The results indicate a U-shaped curve of metonymy comprehension.

The elicitation tasks were firstly about finding out children's ability to use metonymic shorthand, and secondly their willingness to name animates metonymically based on a salient property (Falkum et al., 2017, p. 2). In the first experiment, children were presented with two simple games (e.g., putting straws in plastic glasses or putting magnets on a magnetic board), where the rules were explained to them without the games being named. The children were then asked which game they wanted to play, requiring them to refer to the game in some way. After playing the first game, the children were asked if they wanted to play the second game too, which all of them wanted. The experimenter then asked for a confirmation, asking which game the child wanted to play and thereby elicited a referring expression for the second game as well. The results showed that participants of all ages used the metonymic form of play (e.g., play straws). Children in both age groups did so more often than the adults, which could suggest that metonymic relations may be a referential strategy more readily

available to children than using noun compounds or descriptions. Not only the adults, but also the older children used descriptions more often than the 3-year-olds. In the second elicitation experiment, children were shown pictures with people, animals, or imaginary creatures, each with a salient feature or accessory, and then asked to come up with a name for the experimenter's 'friends'. The purpose was to see if children would use the salient feature to produce a name/nickname for the being in the picture. The results confirmed that pre-schoolers can produce metonyms, more specifically in this case, metonymic names that are based on a salient property. This task did however pose a bigger challenge for the younger children than for the older ones. The authors suggested that the task of using a part of something with a familiar name to produce a new name requires greater metalinguistic awareness than the task of using a part of a whole as a referent.

Taken together, these results are highly interesting, the result of each task pointing to a different developmental curve. In the comprehension study, children as young as 3 years old showed that they could understand metonyms in context, while the 5-year-old children made more errors. The results form a U-shaped curve development. The first elicitation study produced similar results for both age groups, whereas the older children showed greater competence in the second elicitation study. To summarize, the results of Falkum et al. (2017) suggest that several cognitive developmental aspects are involved in metonymy development.

Categorization, identification of whole-part relationships, and the use of salient properties are early skills (Rosch et al., 1976; Bloom, 2000) which young children exploit in their communication strategies. Nerlich, Clark, and Todd (1999), for example, propose that overextensions based on contiguity could be a precursor to metonymy. Based on similar reasoning, Falkum et al. (2017) suggest that for young children, metonymy may serve the same function of filling vocabulary gaps as overextension does. It is possible that young children's understanding and production of metonymy are used for different purposes and rely on different strategies than adults.

A growing metalinguistic awareness may explain the older children's tendency to choose literal over metonymic interpretations. Not a lesser ability to understand metonyms as such, but a competition between the literal linguistic meaning and possible speaker meaning may take place in the 5-year-old's minds; not yet knowing how to resolve it, it may lead to the literal bias in the comprehension of metonymy, which does not however affect metonymy production. Since the 5-year-olds were the oldest group in this study, there is no indication at what age metonym comprehension improves again (although in Van Herwegen et al.'s (2013) study the majority of 6-year-olds had some understanding of metonyms and metaphors).

Köder and Falkum (2020) performed a follow-up study to Falkum et al.'s (2017) study. The age range was expanded from 3- to 5-year-old children to encompass children up to the age of 8 years. A picture selection experiment was carried out again, the result of which confirmed the U-shaped curve development of metonymy comprehension. The youngest and the oldest age groups chose the metonymic interpretation above chance level in the metonymic condition, whereas the 4- to 5-year-old children chose the literal interpretation above chance level in both conditions. In addition to the picture selection task, an eye tracking experiment was performed as a new way to gain further insights into metonymy processing. The results from the eye-tracking study confirmed a sensitivity to metonymy of the youngest participants and improving continuously with age. These results confirm that the metonymic interpretation is highly activated even in the 4- to 5- year-old participants, despite the behavioural data suggesting otherwise.

8.7 Becoming a writer

There are at least three different aspects of linguistic competence to be mastered to become a proficient speaker (Berman & Slobin, 1994). According to Johansson (2009) the same competences are required to become a proficient writer. First, there is the structural level in which the learner must figure out the morpho-syntactic structure of the native language. Secondly, the rhetorical level consists of becoming aware of the features of typical text construction in the native language, and thirdly there is the discursive level, which is about adapting to the exercise. Writing is a complex task, cognitively effortful at all stages ─ whether a child is a beginner, or one is an adult expert writer, writing puts high demands on reasoning and working memory. For young writers, the processes of transcription and orthography are still difficult and later on, when these skills have become automatized, higher-level processes such as creating cohesion in a text or getting across a specific message take significant effort (Myhill, 2008). As Kellogg (2008) notes, not only language generation ─ planning ideas and reviewing ideas, in addition to coordinating these three processes, all demand executive attention. There also needs to be the capacity to hold several representations of the text active in working memory, such as the writer's own notion of the text, the text itself, and the reader's comprehension of the text. Kellogg suggests that this demands a level of cognitive control that is only possible by unburdening the load of the central executive, by practising and automatizing the lower-level processes. Along the same lines, Kress (1982) argues that the necessity to focus on the many different tasks that the writing process demands, constitutes such a cognitive load that young writers'

linguistic ability is not reflected in their written production – the cognitive load will make young writers use the syntactic, semantic, and lexical structures that are most readily available to them.

According to Kellogg (2008), becoming an accomplished writer may take well over two decades, depending on the level of mastery to be acquired. Kellogg suggests that writers progress through three macro-stages of cognitive development, meaning that the writer's proficiency level is reflected by the strategies that are available to them in written text composition. The first two levels are based on two strategies presented by Bereiter and Scardamalia (1987), namely, the Knowledge-Telling Strategy and the Knowledge-Transforming Strategy. The third level, proposed by Kellogg, is the Knowledge-Crafting Strategy.

The students in my study are in the first two stages of the cognitive macro-development suggested by Kellogg, using the knowledge-telling and knowledge-transforming strategies when writing.

In the first stage of the writing learning process, the Knowledge-Telling stage, the writer tells what he/she knows, i.e., is able to retrieve from memory at the moment of writing. Young and inexperienced writers are not yet able to plan their texts but rather write down the associations that are triggered by the topic they are writing about. They might think about what they will write in the next sentence, but without having a goal in mind for the overall content and structure of their texts, and even less a plan of how to achieve such a goal (Bereiter & Scardamalia, 1987). The student writes what comes to mind but is not yet able to hold all the information in working memory and creates a rather impoverished written representation, compared to a much richer mental one. Planning and reviewing take place only to a very limited extent. The inexperienced writer is not yet able to distinguish between the representation in the mind and the one created on paper or screen. The focus is internal on his or her thoughts, rather than on the text as a product and how it might be interpreted by a reader. The written end-product may be incomprehensible even to the authors themselves.

In the second stage, the Knowledge-Transforming stage, the now skilled writer is engaged in planning, translating, and reviewing and has the capacity to work with the text on a global level. This interaction between writer and text requires the writer's ability to distinguish between his/her mental representation of the content he/she wants to convey, and the information actually provided by the text, a capacity not yet developed in the earlier stage of knowledge telling. Reading the text may even provide the writer with new ideas and generate further planning of the text. However, reviewing is still primarily of the author's own representation since the writer is not yet able to take the point of view of a potential reader.

Only in the third stage, the Knowledge-Crafting stage, after many years of practice, are writers capable of reviewing their text with their own representation, as well as with the interpretation of a potential reader in mind. This stage is usually only reached by professional writers who have practised their craft for over twenty years.

8.8 Genre

From an early age onwards, children encounter discourse of both narrative and expository nature. Not only narrative storytelling is part of most children's lives, but also read-aloud non-fiction texts of various kinds, such as books about animals (e.g., pets and dinosaurs) nature and natural phenomena (e.g., the ocean, the sky, volcanos), vehicles (e.g., cars, motorbikes, and tractors), etc. Studies have shown that pre-school children already have some basic capacity to differentiate and produce different genres in the spoken modality (Hudson & Shapiro, 1991; Pinto, Tarchi & Accorti Gamannossi, 2018; Purcell-Gates, 1988). From that basic understanding to a competent differentiation in written text production, however, there is a long way to go (Snow & Uccelli, 2009). Furthermore, different genres make different demands of linguistic and cognitive capacities. In this thesis the interest is focused on the narrative and expository genres. Spoken and written narrative production by children and adolescents has received quite a lot of attention, while expository discourse production is studied much less (Berman & Slobin, 1994; Hickman, 1995; Berman & Nir Sagiv, 2007).

The narrative and expository genres are characterized by different functions and communicative objectives (Berman & Nir Sagiv, 2007; Grimshaw, 2003; Steen, 1999). Narrative discourse is subjective and mainly focuses on people and their intentions, which leads to events (usually) unfolding chronologically in time. Narrative texts written by younger children are often about concrete events and, moreover, they themselves are often the main protagonists. Consequently, their story can rely on episodic memory, rather than on encyclopaedic knowledge (Ravid, 2005). Even young schoolchildren are able to produce coherently written narratives with all the required components, indicating that children aged 9 to 10 years have internalized a schema for narrative discourse (e.g., Berman & Slobin, 1994; Hickman, 1995; Berman & Nir Sagiv, 2007).

Expository texts do not lend themselves as easily to a defined and specific schema. They seldom revolve around people and concrete events, but usually around a specific topic with an objective discourse stance. Neither events nor experiences unfold in expository discourse, but instead issues, ideas, arguments are interrelated, developed, and discussed

(Katzenberger, 2004; Mosenthal, 1985; Berman & Nir-Sagiv, 2007; Ravid, 2006). Bruner (1986) suggests that the topic functions as a superordinate category and all discourse content needs to be relevant with regard to that superordinate topic.

Young schoolchildren are not only capable of following the narrative schema. They are also beginning to learn to make basic generalizations and present an argument by introducing the topic at the beginning, developing ideas around it in the middle, and providing a conclusion at the end (Tolchinsky et al., 2002). Several comparative studies (Berman and Verhoeven, 2002; Berman and Katzenberger, 2004; Nippold, 2002) have shown that narrative texts are more competently written than expository texts. Narratives by participants of all age groups are more coherent and better organized than expository texts.

The complexity of presenting conceptually abstract ideas, in combination with the lack of a clear schema to follow in the expository genre, makes writing expository discourse a challenge. Expository texts written during the earlier school years are more fragmented and incoherent than narrative texts. Even though they have some basic understanding of expository texts, children show difficulties in organizing the content in expository discourse by structuring the text with an introduction, followed by a development of the theme(s) or argument(s), and a conclusion at the end (Berman & Katzenberger, 2004; Nippold, 2002; Ravid, 2005; Tolchinsky, Johansson, & Zamora, 2002). Not until high school age, when metacognitive skills are more developed, does this competence advance, with differences in quality between narrative and expository texts persisting even in adult writers (Ravid, 2005).

As a consequence of the results conveyed above, the established assessment has been that accomplished expository texts are produced almost ten years after good narrative texts (Ravid, 2005). However, studies by Ravid (2005) and Berman and Nir-Sagiv (2007) taking a bottom-up approach, rather than looking at global text organization, expose a more complicated picture. While narrative and expository development follow different developmental timetables and the expository genre poses more challenges, narrative texts are not more advanced in all areas. Data from several corpora show that written expository texts consist of longer clauses and that the rate of content words per clause is higher. Furthermore, expository texts contain more abstract nouns and a higher number of adjectives than narratives (Berman & Nir-Sagiv, 2007; Ravid, 2005), measures which have been used diagnostically in studies of later language development (Levie, 2002; Ravid, Levie, & Avivi-Ben Zvi, 2003; Zilberman, 2003). These differences are present in all age groups. Berman and Nir-Sagiv (2007, pp. 108–109) suggest that:

The bottom-up type of organization entailed by narrative construction is cognitively more accessible than the opposite direction required in expository discourse. Bottom up, data-driven task performance means that children can proceed step-by-step, from item-based, utterance level text construction to structure-dependent organization by means of an internalized narrative schema (Berman, 1995). Top-down, topic-motivated global-level text construction requires very different cognitive abilities because it involves relating concepts and categories within an abstract systemic whole (Bruner, 1986).

8.9 Swedish studies

To the best of my knowledge, there are no Swedish studies investigating language development during the school years with a focus on semantics. The majority of existing studies are carried out on behalf of, or in connection with the National Agency for Education, where the focus has been on aspects such as syntax, vocabulary size, and text structure, but not on meaning. Hultman and Westman (1977) performed a large-scale study analysing 151 texts written by students in their last year of high school to investigate whether the pupil's writing met the goals of the curriculum. The texts were analysed primarily with regard to syntax, part of speech distribution, and vocabulary size. That study marked the starting point for Swedish research on texts written in schools (Johansson, 2009). Einarsson (1978) performed a (primarily sociolinguistic) study of texts written by students in the third year of upper secondary school and by adult professional writers. Part of his analysis was the noun phrase, including nominal constructions and their ratios. More recent work of a similar kind has been carried out by Nyström (2000) with texts written in Upper Secondary school, Ciolek Laerum (2009) with texts written by students in Grade 9, and Nyström Höög (2010) with texts from Grades 5 and 9. Johansson (2009) performed an innovative study looking at developmental patterns of text production. By using a keystroke logging program, she investigated not only finished texts, but also the real-time process of text production with 10-, 13-, and 17-year-old students and a group of university students.

8.10 Summary

The purpose of this chapter has been to show that there are numerous aspects contributing to the complexity of adjective acquisition, use, and development. Word meanings emerge in context, and for adjectives the process of meaning creation is complicated by adjectives receiving their meaning by conceptual integration with the noun. In addition, aspects such as boundedness, gradeability, and construction are part

of the meaning making and need to be taken into account. Furthermore, noun ontology, i.e., level of abstraction and adjective and noun domains are semantic parameters developing significantly over time. It is shown that noun acquisition seems to start earlier than adjective acquisition, but some understanding of adjectives expressing properties, can also be seen in very young children. However, young language learners' knowledge merely constitutes the beginning of a life-long developmental process. Young children start out expressing concrete noun meanings, later learn to predicatively modify them with adjectives expressing for example size and colour and go on to express complex abstract meanings using different constructions, such as *she is an intellectual woman* and *political opinion*.

This chapter concludes the theoretical part of the thesis. The remainder of this book is devoted to the empirical study on adjective and noun combinations in compositions written by Swedish students during the school years.

9 Data and method

This chapter provides a description of the methods used in this study. In order to gain insight into the conceptual and semantic development during the school years, essays written by students at different ages were analysed. Since it was not possible to carry out a longitudinal study, a cross-sectional, pseudo-longitudinal study design was used. This means that data was collected from different age groups. The material consists of a selection of written texts produced in Swedish schools within the scope of obligatory 'national tests' within the subject Swedish language, performed in Grades 3, 5, 9 and 11/12 grade in upper secondary school (B-course).

Section 9.1 gives a description of the Swedish national tests and how they are implemented in the schools. The information is assembled from the material provided for teachers and students by the Swedish National Agency for Education. This chapter starts with a description of the procedure for how the students' texts are generated within Swedish schools as part of the national tests in Swedish, followed by a presentation of the data set chosen for this study. Section 9.2 provides a description of how the parameters of the LOC model and adjectival functions are operationalized in the analysis of the data.

9.1 The text material

Every year, a set of national tests is conducted in a number of subjects in Swedish schools. In 2009, the year from which this study draws its data, tests were performed in Grades 3, 5, 9, and Grade 11/12 in upper secondary school. The tests are commissioned by the Swedish National Agency for Education and implemented in class. The rationale for having national tests in the Swedish school system is that students' performance can be assessed in a uniform manner, independently of school, teacher, and teaching method. Furthermore, the test results can serve as a basis for discussion between student and teacher, as well as a tool to assess students' performances over time. Yet another important reason for the test is the screening function — a way of identifying students who need extra help.

A specialist group within the Department of Scandinavian Languages at Uppsala University is responsible for developing the test design, with input from researchers and other experts. The tests are designed to be age-appropriate and to elicit the students' level of competence. Every year, several new oral, reading, and writing tests are created. Depending on grade, the type and number of tasks vary. However, one of the written tasks in all grades consists of the writing of essays, namely, a narrative or an expository text, or in the case of Grades 3 and 5, one in each genre. The course tests for the most advanced students are designed to suit both students in upper secondary school and those in adult education. To evaluate advanced students' language skills, these tests require a great variety of tasks. They are also designed to be suitable for all students, regardless of their educational programme.

9.1.1   Procedure, data collection, and data

In the following sections I describe how the material was generated as part of the national tests in Swedish. The test procedures, described in detail below, were designed to suit the different ages and were part of the obligatory curriculum, which is the reason why they differ in the different grades.

The data for the current study

The majority of the test results are archived locally by the municipality, but the research group designing the tests receives a random selection of texts (written by students born on certain dates in certain months) in order to evaluate the test design, make reports about the results, and use them for research.

The texts used in the present study are a selection of the random sample of texts available at Uppsala University. Only compositions marked as being written by native speakers of Swedish were chosen. This does however not guarantee that all non-native speakers and bilinguals were excluded. The selected material is balanced with respect to gender, and as far as was possible with regard to genre and topic.

9.1.2   Narrative and expository texts from Grades 3, 5, 9, and 11/12

Table 9.1 provides an overview of the whole data set used in this study and is followed by a more detailed presentation for each grade. The data set from Grade 3 consists of 100 texts from each genre, by 50 male and 50 female students. Each student wrote one text in each genre. Text length is short in Grade 3, which justified the high number of texts. The reason for the even higher number of texts in Grade 5 (166 texts in each genre) was the number and combinations of topics the students could choose from.

Each student wrote one text in each genre. The aim was to have an as balanced as possible a data set with regard to genres and topics (and how they were combined), while still having a meaningful number of texts from each topic. In Grade 9 each student wrote either a narrative or an expository text. The texts are much longer and 80 texts from each genre were transcribed. In Grade 11/12 students could choose among eight expository topics for their essay. One topic, about the Nobel Prize, was chosen by very few students and was therefore excluded from this study. Ten texts by each gender from the seven remaining topics were included in this study, adding up to 140 texts.

Table 9.1
Number of texts from the four grades in the two genres

	Grade 3	Grade 5	Grade 9	Grade 11/12
Narratives	100	166	80	
Expository	100	166	80	140
Total	200	332	160	140

Procedure, data collection and data: Grade 3

In Grade 3 every student was requested to write both a narrative and an expository text. The topic of the narrative text was 'Fear', and the topic of the expository text was 'The Language of Animals'.

The narrative task – Before the day of the test, the children had read and discussed a text called 'The Blood League' in class. They had also discussed their own experiences related to fear. On the day of the test, the teacher retold the story by talking about it and about fear in general, and how the students may relate to it. Additionally, the teacher showed pictures related to the story and encouraged the students to discuss the pictures and talk about what they were afraid of.

The students in Grade 3 did not receive any written instructions but were orally instructed to write a story with a beginning, a middle, and an end. Each student was allowed to use all the time they needed to finish their text.

When writing their essay, the students were allowed to use the text as inspiration, but they also had the option to write about an experience they themselves had had, or alternatively, to use their imagination and make up a story. In addition to the text, the children received a booklet with pictures they could use as inspiration.

The expository task – Before the day of the test, the students had read and discussed a text about 'Human and Animal Language' in class. On the day of the test, the teacher

repeated the content of the text about how animals show their emotions and how they communicate with each other. In addition, a picture related to the topic was discussed in the classroom.

The students received oral instructions to write about how horses, elephants, and chimpanzees use their languages in different ways. They were free to choose if they wanted to write in detail about one of the animals, or if they wanted to write about several of them. Additionally, they were free to add their own knowledge and experiences about how animals communicate. The students were reminded that the task consisted of writing an expository text, i.e., that they should explain facts and not tell a story. Pictures were provided as support and each student was allowed to use all the time they needed to finish their story.

Table 9.2 shows an overview of the data set from Grade 3. Every student wrote one narrative and one expository text. Fifty texts from each genre and gender were included in this study, adding up to 200 texts in total.

Table 9.2
Number of texts from Grade 3 written by girls (F) and boys (M) in each genre

Grade 3	F	M
Narrative: Fear	50	50
Expository: The language of animals	50	50
Total	100	100

Procedure and data: Grade 5

The students in Grade 5 also produced a narrative and an expository text each. In contrast to the students in Grade 3, the students in Grade 5 had a choice between two or three different topics within each genre.

The narrative task – The narrative task was prepared by reading a text titled 'The Hut'. After having read the text, the students answered a questionnaire about it. The content of the text was also discussed in the classroom. The students could choose to write a narrative text entitled 'My Hut', where they were free to tell a story of their own hut if they ever had one or could write about their dream hut. Alternatively, they could choose between two other topics, namely, to write a narrative titled 'An Excursion' where they could recount the memories of an excursion special to them, or a narrative titled 'An Event I Remember' – where they were free to write about some other memorable event. The text the students had read in preparation for the task was also provided during the writing session. The students were free to choose if they wanted to use the text as a source of inspiration or not.

The expository task – The expository task was prepared by the reading of a text 'On the Hunt for Age-old Treasures'. After having read the text, the students answered a questionnaire about the text. The content of the text was then discussed in the classroom. The students received a written instruction to 'write and explain'. They had read, answered questions, and talked about the text 'On the Hunt for Age-old Treasures', and were now requested to write a text of their own. They were free to choose one of the following proposals:

Everyone in your class is supposed to write about a hobby or recreational activity. The purpose is to inspire the students in third grade to try a new hobby or activity. Try to convince them to start with your hobby or activity. Explain what makes it so enjoyable or interesting. Explain why others should try it. Title: Try something new!

Or: Everyone has something that is extra special to them. Maybe it is a piece of jewellery, an object, a person, or an animal. Why do you think something can become of such importance? Is everyone of the same opinion? Explain what your treasure is and why it means so much to you. Choose between the titles: 'My Treasure' or 'Something Important'.

To recapitulate, students in Grade 5 had three narrative and three expository topics to choose from, adding up to nine possible combinations of topics. All students wrote one text in each genre. For both tasks the students had 40 minutes at their disposal. Table 9.3 provides an overview of the data set from Grade 5. When possible, 20 texts (10 written by girls and 10 by boys) were chosen in each of the nine combinations. The topics 'Something important' and 'My treasure' and 'An excursion' did not exist (within the collected data) in 10 exemplars in combination with every other possible topic and were therefore represented by fewer texts.

Table 9.3
Number of texts from Grade 5 written by girls (F) and boys (M) in each genre

Grade 5	F	M
Narrative & expository		
My hut & Try something new	10 + 10	10 + 10
My hut & Something important	10 + 10	9 + 9
my hut & Min koja & My treasure	10 + 10	10 + 10
An excursion & Try something new	10 + 10	10 + 10
An excursion & Something important	10 + 10	5 +5
An excursion & My treasure	9 + 9	3 + 3
An event I remember & Try something new	10 + 10	10 + 10
An event I remember & Something important	10 + 10	10 + 10
An event I remember & My treasure	10 + 10	10 + 10
Total	178	154

Procedure Grade 9

In Grade 9, the students did not get to read the texts related to the writing task beforehand. A booklet with essays, poems, and an extract from a novel, all related to the topic of 'Nightlife' in some way, was handed out at the beginning of the writing session. There was also a picture in the booklet, showing a tower block where all the windows, except for one, were dark. The students could choose one topic of four, two of which were narrative and two of which were expository.

Tasks to choose from:

Topic 'Nightlife' — The texts 'Gaming all night is what the boys like to do' and 'Scorching hot' are about the excitement of being awake during the night.

A publisher is about to issue an anthology called 'Nightlife' for teenagers. The editor is therefore requesting to learn from teenagers themselves about experiences of being awake at night when everyone else is asleep. You decide to submit your contribution.

Instruction: Write your *contribution to the anthology*. Describe an experience you had being awake late or in the middle of the night. Why do you remember this event and what made it so special?

Topic 'Short story' — Look at the picture of the tower block on page 10 in the booklet. Think about what it depicts, at what time during the day is it taken and from what perspective? The library in your neighbourhood has announced a short story competition where the story should emanate from the picture. The winner will have his/her short story published. You decide to enter the competition.

Instruction: Write your *short story*. Make use of the atmosphere, ambience, and details of the picture when you write. Choose your own title.

Topic 'New times?' — Not everyone has the same diurnal rhythm, and it can be hard to adapt to the clock. Some teenagers might like to adjourn the school day in order to better cope with their studies. In your municipality it has been decided that the school day will last from 11 a.m. until 6 p.m. In the local newspaper there is a hot debate going on concerning the decision, and you decide to join in.

Instruction: Write your *debate contribution*. Briefly describe your own diurnal rhythm and take a stance on the decision of the municipality. Defend your position.

Topic 'When darkness falls' — The fear evoked by what may hide in darkness and which makes the imagination race, is something most of us have experienced. It can be on our way home or in the space of our bed, which usually feels safe.

The youth magazine *Glow* is planning an issue about the night and is calling for teenagers' contributions about their fear of the dark.

Instruction: Write your *contribution* about fear of the dark. Reason about triggers and what one can do about the fear of the dark.

The students were free to use the texts in the booklet as an inspiration. Since the students were to choose only one of the topics, each student wrote only a narrative or an expository text, and not one of each. The students had 160 minutes to read the booklet and write their texts. They were allowed to use a dictionary.

Table 9.4 provides an overview of the Grade 9 data set. Twenty texts per topic were transcribed (10 by female students and 10 by male students), adding up to 160 texts in total. Two topics were excluded because they were chosen by a very small number of students and not enough texts were among the collected material.

Table 9.4
Number of transcribed texts from Grade 9 written by girls (F) and boys (M) in each genre

Grade 9	F	M
Narrative: Nightlife	20	20
Narrative: Short story	20	20
Expository: New times?	20	20
Expository: When darkness falls	20	20
Total	80	80

Procedure Grade 11/12

Before the day of the test, students received a booklet with a diversity of texts related to the broader topic of 'Engagement and influence' — articles, chronicles, commentaries, and analysis. A supplementary booklet containing the choice of nine test tasks to choose between was handed out on the occasion of the test.

Tasks they could choose from:

Topic 'Consumer power' — Write an article. Use texts in the booklet and *give examples* of environmentally friendly products and/or services.

Instruction: Explain what choices you think the consumer should make. Argue which possibilities people have by their consumer choices.

Topic 'Pull one's weight' — Write an article.

Instruction: Present a question you find urgent and *explain* why this matter is so important. *Give an account* of what you want to do to change the situation.

Topic 'Nature versus nurture' ─ Write an essay.

Instruction: Discuss, with the help of texts in the booklet, the importance of nature and nurture and *disclose* your own opinion. *Provide examples* of factors that influence our personality.

Topic 'With hindsight' ─ Write your argument.

Instruction: Discuss the pros and cons of the current Swedish school system and *explain* how it has affected you. Use your own experiences and texts in the booklet if you want and *compare* with some other school or education.

Topic 'Exposed' ─ Write a web article.

Instruction: Exemplify how people are visible on the internet or in the media. Use texts in the booklet and *discuss* the consequences of the new possibilities of visibility. Take your own stance and *argue* for it.

Topic 'The light in the movie theatre' ─ Write your essay.

Instruction: Use a movie which has affected you in a positive way and pin down what aspect(s) of the film made an impression. Recount some of the thoughts presented in the article about Tomas Axelson's research and discuss how a film can affect the viewer.

Topic 'Aggrieved' ─ Write your argument.

Instruction: Describe what Zaremba writes on aggrievement. Write about *your own opinion* about people of today feeling more aggrieved than before and *argue* for your own opinion.

The time allocated for writing was 5 hours. The students were allowed to use a dictionary.

Table 9.5 provides an overview of the Grade 11/12 data set. Twenty texts per topic (10 by male and 10 by female students) add up to 140 texts in total.

Table 9.5
Number of expository texts from Grade 11/12 written by girls (F) and boys (M)

Grade 11/12	F	M
Consumer power	10	10
Nature versus nurture	10	10
With hindsight	10	10
Exposed	10	10
The light in the movie theatre	10	10
Aggrieved	10	10
Pull one's weight	10	10
Total	70	70

Limitations of the data

As described above, it was decided that the best method to adopt for this study was a cross-sectional, pseudo-longitudinal study, using natural data. This has proven to be a fruitful approach, but there are a few possible drawbacks to this data selection. The advantages and disadvantages of the data set are addressed in this section.

At the beginning of the study, in the data collection stage, the intention was to collect an equal number of essays from each grade, and of every genre and topic within the grades. This did not only prove to be difficult, but it would not have been meaningful either. Firstly, the number of words per essay differs substantially between the younger and older students. Secondly, the number of topics between which the students could choose from varied from one grade to another. Thirdly, it was not in all grades that the students wrote essays in both the narrative and expository genres. Furthermore, the availability of certain topics in certain groups was limited. As a result of these circumstances, the set of texts is not balanced in the way it was planned but was instead guided by the prerequisites of the individual tests in the different grades, and in certain cases by availability. While these might be shortcomings of collecting natural data, it is my assessment that the advantages outweigh the disadvantages. The tests are designed by a group of professionals to be customized for the specific age groups. Furthermore, it allowed the collected essays to come from many different schools, from all parts of the country. Finally, the essays were written in an environment and under circumstances with which the students are familiar, allowing their attention and cognitive resources to be focused on the task at hand.

9.1.3 The transcription and digitization process

Since the texts were handwritten, they needed to be transcribed in order to create a digitized corpus. At the beginning of the process this was done in a text editor, but as the work progressed, the advantages of having the texts in chat format analysable by the CLAN programs (MacWhinney, 2000) became clear. The already existing text files were transformed into chat files and new transcriptions were made directly in the chat-system.

The transcriptions being performed from one kind of text format (handwritten) into another (computer-written), made the orthographic transcription process relatively uncomplicated. In the texts by the younger children, however, there was occasionally the challenge of determining where one sentence ended and another began. In the transcription process the following graphic elements were used to determine where one sentence ended and a new one began: (a) full stop followed by an upper-case letter, (b) full stop followed by a lower-case letter or the absence of a full stop, but the beginning of new clause with an upper-case letter; (c) the start of a new clause on a new line.

9.2 Annotation

The LOC model is not only a semantic model for meaning making; it also functions as a tool for the analysis of meaning in discourse (Paradis, 2005). LOC has served as a tool for semantic analysis on a number of topics, such as antonymy, metonymy, metaphor, negation, modifiers of degree and modality, and adjective gradability (Bianchi et al., 2017; Farshchi et al., 2019; Hartman & Paradis, 2018, 2021; Jones et al., 2012; Paradis et al., 2015; van de Weijer et al., 2014). LOC has proven to be a fruitful way to describe and explain the meaning structures of adjectives and it constitutes the model for analysis in this study.

In order to gain insight into the meaning of every individual contextual use of all the adjective occurrences in the data set, the study uses a qualitative analysis in the form of a fine-grained manual annotation of each adjective-noun occurrence in the corpus, and quantitative measures of parameters such as text length, lexical density, and number of adjectives supplement the qualitative study.

For the manual annotation of the adjective-noun combinations, a FileMaker Pro database was created. The main methodological strategy used in the analysis of the texts starts with the lexical items in each and every case to their actual discursive interpretations in context, i.e., from linguistic items to their contextual interpretation. The following annotations were manually performed in the FileMakerPRO database.

Adjectives were annotated with regard to four parameters:

- their configuration with regard to gradeability

- attributive or predicative position

- what function the adjective has by modifying the noun

- the content or schematic conceptual domain

Nouns were analysed with regard to two parameters:

- the content domain of the noun

- their levels of abstraction being 1st, 2nd, 3rd order according to the LOC model, with an additional sub-group created for meanings to do with TIME, called 4th order meanings.

The adjective noun combination as a whole was also analysed with regard to its meaning as basic, metaphorical, or metonymical. Figure 9.1 shows a screenshot of the FileMakerPro database.
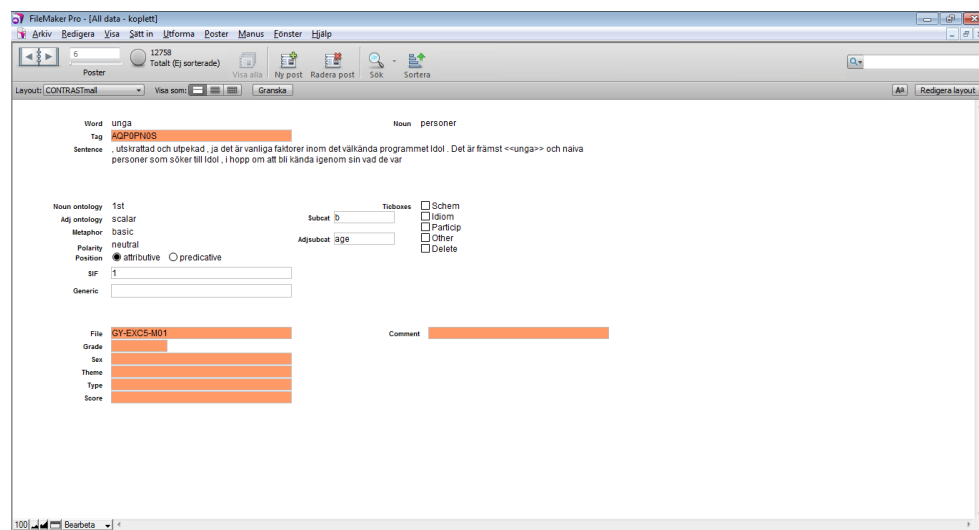
Figure 9.1
Screenshot of the FileMakerPro interface

9.2.1 The adjective and noun parameters analysed in this study

Gradeability

All adjective occurrences were categorized with regard to the schematic configuration of gradeability, as being either scalar, non-scalar, or non-gradable. Most adjective meanings are predisposed to have one of the configurations as a standard, but this default configuration is just as susceptible to change as the content part of the adjective. Different contexts and different communicative needs may call for an alternative construal, which is created by combining the adjective with an unexpected degree modifier. *Dead* in its basic meaning, for example, combines with bounded degree modifiers, such as *completely*, a mobile phone running out of battery, however, may be combined with an unbounded degree modifier to metaphorically be described as *almost dead*.

Constructional use and adjectival functions

All adjectives were annotated with regard to their position being attributive or predicative. The adjective position is governed both by the function of the adjective in the particular context and, in the case of specification, by its intended meaning in the particular context.

A sub-portion (1000 from each grade) of all adjectives were annotated for adjectival function according to Frännhag's (2010) model. See chapter 4.4 for a detailed description. The functions are defined as follows:

- Specification

  The role of specifiers is to describe some aspect of a referent; their function is to add information.

- Kind identification

  The adjective identifies a sub-kind of some thing or concept.

- Element identification

  The function of identifiers is to restrict the number of potentially intended entities.

- Identity provision

  When the intended element belongs to a structural space and is unknown to the interpreter, the adjective and noun serve to provide identity.

- Stipulation

  Stipulation is the function of specifying a condition something has to meet in order to qualify as the intended referent.

Adjective domains

The categorization of adjective domains was divided into schematically biased domains and content-biased domains. The schematically biased domains were borrowed from Frännhag (2010) with the omission of the domains of CONTAINER, CENTRE-PERIPHERY, FOCUS, GRANULARITY, and SPATIALLY ORIENTED WHOLE (cf. Table 4.1 in section 4.1.2). These domains were included to begin with, but due to lack of occurrences in the data, they were excluded. The categorization of content-biased domains was heavily based on Hundsnurscher and Splett's (1982) suggestion for German adjective domains but adapted to be suitable for this particular data and its analysis. Their classification included 13 major categories of adjectives (perceptual, spatial, temporality-related, spatio-temporal, material-related, body-related, mood-related, spirit-related, behaviour-related, social-related, quantity-related, relational, and general), each with up to nine sub-categories. The 13 major categories are all included in this study, but only a selected number of the sub-categories. I do not follow their exact categorization with respect to main and sub-categories and my terminology may differ slightly from theirs. Table 9.6 below shows the adjective domains used for the annotation of the data in this study.

Table 9.6
Content and schematic adjective domains

Adjective domain (content)	Sub-domains	Examples
Age	Age of people, animals, and objects In relation to time passed since first encounter (people) or acquisition (objects)	old, young, new
Appearance related	People	cute, nice, ugly
	Artefacts	beautiful, ugly
Body related	Body related	tired, hungry
	Health related	healthy, sick
Colour	Colour	green, light blue
	Light – dark	dark, light
Common	Ordinary, prevalent, uncommon	usual, rare
Demeanor & disposition	Attitude, behaviour, characteristics	nice, horrible, caring
Difficulty	Intellectual, physical	easy, difficult
Emotion	Positive, negative	happy, sad, afraid
Force	Strength	strong, weak
Importance	Relevance, significance	important, unimportant
Location	Location	southern
	Nationality	Swedish
Manner	Movement, modality	running, crawling, oral, written
Merit	Positive, negative	good, bad
Money related	Price, value	expensive, cheap
Spatial	Distance	short, infinite
	Length	short, long
	Size	small, large
	Spatial	deep, limited
	Width	wide, narrow
	Weight	heavy, light
Perception	Sight, hearing	tasty, loud
Result	End state, readiness	ready,
Competence	Skill / intelligence	smart, skilful
Social	in relation to people	popular, lonely
Time related	Time of day, in relation to reference point	late, early, delayed, contemporary
Weather	Natural phenomena, subjective experience	sunny, rainy, beautiful

Schematic domains		
Amount	Degree	absolute, somewhat
	Frequency	frequent, rare
	Quantity	several, numerous
Counting scale	Counting	first, seventeenth
	Non counting	initial, final
Epistemic	Truth	true, false
	Certainty	uncertain, certain
	Possibility	probable, potential
Match – non match	Similarity, dissimilarity, complete match	same, different
Time scale	Before and after reference point	

The nouns occurring in the adjective noun combinations are primarily analysed with respect to their ontology. First order entities are then analysed on a more fine-grained level with regard to their content domain. These domains were directly borrowed from the LOC model, see Table 9.7.

Table 9.7
First order nominal domains

1st order sub-domains	Sub-domains	Examples
Animal	Animal	cat, dog, fish
	Animal body parts	snout, tail, fin
People	People	person, Maria, child
	Body parts	arm, leg, head
Artefacts	Objects	toy, computer, car
Natural objects / phenomena	Temporary, permanent	storm, rain, stone, mountain, ocean
Location	Point or region on a map	Country, region, Sweden
Food	Sustenance, enjoyment	hamburger, Sushi, apple
Colour	Chromatic, monochrome, brightness, darkness	green, yellow, light, dark
Sounds	Natural sounds, man made sounds, pleasant, unpleasant	noise, clash, music

9.3 Summary

The purpose of this chapter has been to describe the data collection procedure, to present the data selection, and to describe the annotation method. It is important to remember that each and every adjective and noun meaning is annotated with regard to their meaning in the context of the particular instance of use. For example, the adjective meaning *best* may be annotated as non-scalar in one context (e.g., 'They are the best publisher for art books') and as gradable in another context (e.g., 'She is the very best author I know'). Similarly, in one context the nominal meaning *book* may be annotated as a 1st order meaning and in another context as a 3rd order meaning, depending on whether it is the tome or the content that is talked about (e.g., 'Please give me the red book', versus 'This is such an interesting book').

In the next four chapters the results of the analysis will be presented. In chapter 10, a summary of the production data from the essay corpus is presented. Age, gender, and genre comparisons are made. Chapter 11 presents the results of the analysis of nominal

meanings, more specifically, noun ontologies and noun domains. In chapter 12, the results of the analysis of adjective meanings are presented, namely, adjective domain, gradeability, construction, function, and position. And finally, in chapter 13, the result of metaphor and metonym uses will be presented.

10   Production measures

In this section, I present the measures text length, sentence length, number of sentences, lexical diversity, and number of adjectives in the four grades and in the two genres. While these results are interesting in their own right, it is also of interest how these measures correlate with age and genre. I expect, for example, text length to increase for each grade, both in terms of longer and a higher number of sentences. Furthermore, developmental changes are expected for lexical diversity, number of adjectives, and adjective diversity, which are measured and correlations between them investigated.

10.1 Text length

Text length is presented in terms of number of word tokens and number of sentences per text. The number of words per sentence, i.e., sentence length, was also calculated. Cognitive development and schooling are assumed to advance the students' ability to reflect on different topics and express their thoughts in writing. This development is expected to result in longer narrative and expository texts.

10.1.1 Word tokens per text

Figure 10.1 shows the average numbers of word tokens in the narrative and expository texts written by students from the four grades. The number of tokens increases with each grade and this development truly takes off somewhere between Grades 5 and 9, the texts written by students in Grade 9 are three times as long as those written in Grade 5. Narrative texts are consistently longer than expository texts. ANOVA revealed interaction effects for grade and genre and post hoc analyses were performed for a more detailed study of the development. The results show that in Grade 3 the difference between the genres is not significant. In Grades 5 and 9, the narrative texts are significantly longer than the expository text (p = 0.002 in Grade 5 and p = 0.0019 in Grade 9). While there is no significant difference in number of words between Grade 3 and 5 expository texts, the narrative texts in Grade 5 are significantly longer than those in Grade 3 (p = 0.001). The development between Grades 5 and 9 shows

significantly more words in both genres in Grade 9 (*p* = 0.000 for narrative and expository texts). Since the students in Grade 11/12 did not write narrative texts, there is no data available to compare genre differences in this age group, nor the development for narratives between Grades 9 and 11. The results from the expository texts do, however, confirm that at least in this genre, the number of words continues to increase after Grade 9, as the texts from Grade 11/12 were one third longer than the texts from Grade 9 (*p* = 0.000). There were significant gender differences in Grades 3, 5 (both p = 0.000), and 9 (*p* = 0.003), with girls writing longer texts, but not in Grade 11/12 (*p* = 0.451).
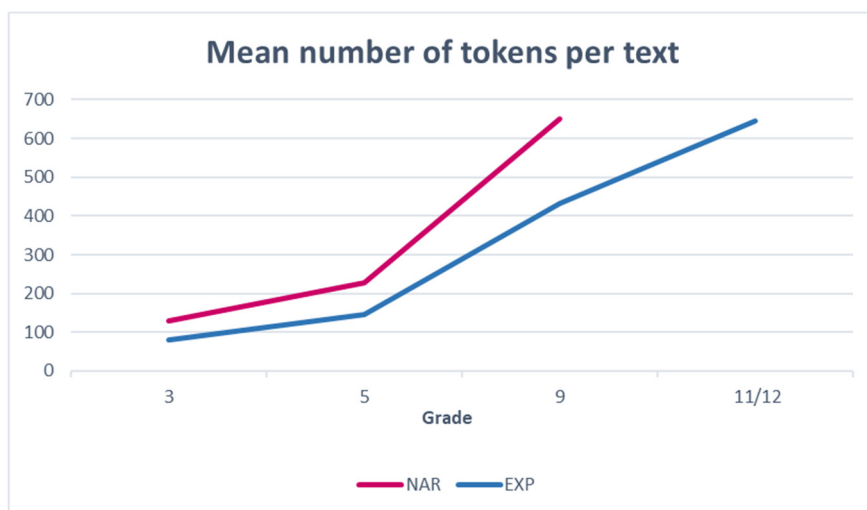
Figure 10.1
Average numbers of word tokens of narrative and expository texts in Grades 3, 5, 9, and 11/12

10.1.2 Text length in number of sentences

A different measure of text length is number of sentences. The number of sentences per text was calculated by the CLAN program MLU. As can be seen in Table 10.1, the mean number of sentences in narrative texts ranges from 13.25 in Grade 3, 19.25 in Grade 5, and 54.16 in Grade 9. The standard deviation increases the longer the texts get. The mean number of sentences in expository texts increases from 6.89 in Grade 3 to 11.13 in Grade 5, 29 in Grade 9, and 37 in Grade 11/12. Again, the standard deviation increases as the mean text length increases.

Table 10.1

Average number of sentences in narrative and expository texts in Grades 3, 5, 9, and 11/12 (standard deviations provided in parentheses)

	Grade 3		Grade 5		Grade 9		Grade11/12
	NAR	EXP	NAR	EXP	NAR	EXP	EXP
Number of sentences	13.25 (9)	6.89 (3)	19.25 (16.74)	11.13 (5.53)	54.16 (35.2)	29.00 (13.15)	37.00 (16.3)

ANOVA showed that the narrative texts consist of significantly more sentences than the expository texts in all three grades where a comparison was possible (i.e., not for Grade 11/12, where only expository texts were produced). There are no significant differences between Grades 3 and 5 in either of the genres. This changes between Grades 5 and 9, where the difference for the number of sentences is significant in both narrative and expository texts ($p = 0.000$). There is no significant difference between the expository texts in Grades 9 and 11/12. Girls generally wrote more sentences, and the differences are significant in all grades (Grade 3, $p = 0.000$, Grade 5, $p = 0.003$, Grade 9, $p = 0,003$, Grade 11/12, $p = 0.018$).

10.1.3 Number of words per sentence

The number of words per sentence in the essays analysed in this study was calculated by the CLAN program MLU. Table 10.2 shows mean number of words per sentence.

As can be seen in Table 10.2, in Grade 3 the mean number of words per sentence in narrative texts is 11.21 in Grade 3, 15.21 in Grade 5, and 13.32 in Grade 9. In Grade 5 the mean number of words per sentence in the narrative texts is higher than in Grade 9. The standard deviation is highest in Grade 5. The sentences in expository texts are somewhat longer, ranging from 12.07 in average number of words in Grade 3, to 15.51 in Grade 5, 16 in Grade 9, and 18.03 in Grade 11/12. Again, the standard deviation is highest in Grade 5.

Table 10.2

Average number of words per sentence in narrative and expository texts in Grades 3, 5, 9, and 11/12 (standard deviations provided in parentheses)

	Grade 3		Grade 5		Grade 9		Grade 11/12
	NAR	EXP	NAR	EXP	NAR	EXP	EXP
Words per sentence	11.21 (6.09)	12.07 (3.22)	15.21 (17.02)	15.51 (15.93)	13.32 (3.93)	16.00 (4.14)	18.03 (5.21)

ANOVA revealed only one significant difference in mean number of words per sentence, which was between Grades 3 and 11/12 expository texts. The differences in between those grades were not significant, neither were the genre differences. The box and whiskers plot in Figure 10.2 shows the central tendency and range of number of words per sentence for the different grades and genres. The horizontal lower and upper lines of the box indicate the position of the lower and upper quartile. The horizontal line within the box shows the position of the median. Figure 10.2 is particularly interesting because it shows considerable individual differences present at all ages, but particularly in Grades 3 and 5. There were no gender differences except, surprisingly, in Grade 11/12 (p = 0.000).
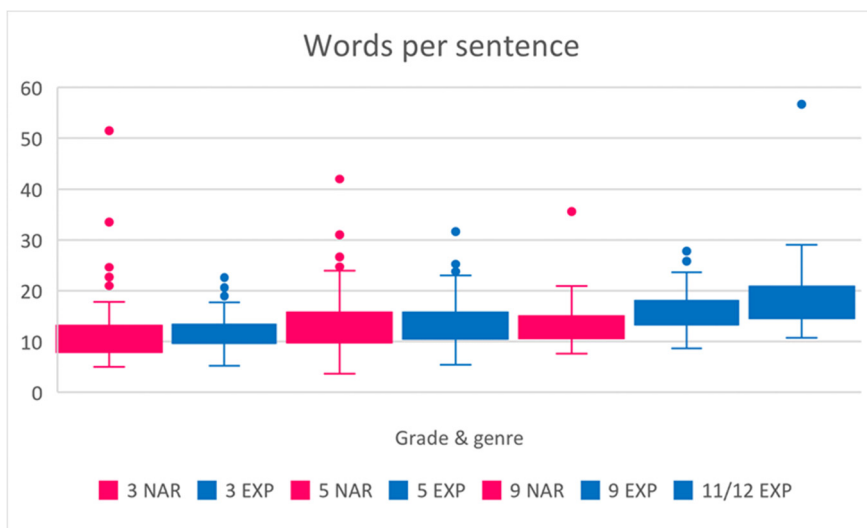
Figure 10.2
Outliers in relation to average number of words per sentence in narrative and expository texts in Grades 3, 5, 9, and 11/12.

10.1.4 Summary and discussion of the results for text length

Text length measured as number of word tokens depends on the individual students' writing ability, topic, genre, and writing time. In experimental contexts, where parameters such as preparation, writing time and topic are controlled for, text length might reflect grade, genre, and compositional fluency. In this study, the students from different grades had different amounts of time at their disposal. (cf. section 9.1 for specifics). The younger students had less time at their disposal than the older students. No doubt, just as the topic of the compositions was chosen to suit the different age groups, the time available for writing the compositions was also adapted to the age

group. Furthermore, while the time limit set the maximum writing time, students were not obliged to use the whole session to finish their text. The actual time spent writing is therefore unknown. Since some students may not have used the whole session and turned in their texts early, text length does not function as a fluency measure in this study. Trusting that the customized topics and writing times were accurately adapted to the students' cognitive ability, writing ability, and endurance, a comparison between the grades, to see developmental trends, still seems meaningful. Another aspect of interest to do with text length is genre and whether genre affects text length.

As was to be expected, both narrative and expository texts got longer with each grade, consisting of a higher number of sentences and longer sentences. The difference in number of tokens between Grades 3 and 5 is rather small (and not significant), but a developmental leap takes place somewhere between Grades 5 and 9. Narrative texts are consistently longer than expository texts. In all grades except for Grade 11/12, i.e., the oldest students, girls wrote longer texts than boys. The results in the current study mirror the results of earlier Swedish studies. While most of those studies (Ciolek Laerum, 2009; Hultman & Westman, 1977; Nyström, 2000; Nyström Höög, 2010) look at one age group specifically, rather than studying development, the number of word tokens in the grades that were studied are close to the results in the corresponding age group and genre in this study. Furthermore, just as in this study, in those studies girls wrote longer texts than boys. The results from Johansson's (2009) cross-sectional study, which covered the development of text length over the school years, looking at age groups close to this study, showed both similarities and differences. The developmental curve for written narrative and expository texts looks very similar to the one in this study, although with the big difference that expository texts are consistently longer than narrative texts. An additional difference is that the data in Johansson's study did not show any gender differences. Ravid and Levie's (2010) cross-sectional study with Hebrew-speaking students from the same age groups resulted in shorter texts overall than the essays in the Swedish study, but the developmental curve corresponds to those presented in other studies. In line with the current study, narrative texts were consistently longer than expository texts. However, just as in Johansson's study, there were no gender differences.

Only one significant difference in mean number of words per sentence was revealed, which was between Grades 3 and 11/12 expository texts. The differences from one grade to another were not significant, neither were the genre differences.

Sentences can (although not always) get longer as a result of higher complexity and the use of more advanced syntax – aspects that may manifest in a multitude of ways. For example, the conjunction of sentences by means of adverbial conjuncts, such as *alternatively*, *consequently*, *hence*, *nevertheless*, *furthermore*, etc. often leads to longer

sentences. The subordination of clauses, including, for instance, adverbial, relative, and nominal clauses, likewise results in longer sentences. Moreover, the use of low-frequency syntactic structures such as cleft constructions and post-modification with prepositional phrases, often creates longer sentences as well (Nippold, 2016). While the use of these types of structures becomes more common in higher grades, the increase is stretched out over a long period of time. According to Scott (1988), statistically significant differences between age or grade levels of one to two years are rare.

10.2 Lexical diversity

Lexical diversity is a measure based on the number of different word types used in a text (Johansson, 2008). That is, the more different words there are used in a text, the more lexically diverse the text is. A long text using the same words over and over again is less lexically diverse than a short text with many different words.

The D measure is integrated into the package of CLAN programs (MacWhinney, 2000) as VOCD. Fifty tokens is the minimum number of words per text required by the VOCD program in order to get reliable results. There were 14 texts written by students in Grade 3 that did not fulfil that condition. One of these texts was a narrative text, all the rest were expository texts, 11 of them written by boys and two by girls. Six of the texts had between 45 and 49 words, four texts between 40 and 44 words, three texts between 35 and 40 words, and one text had only 20 words. Figure 10.3 shows the mean values of VOCD for all texts consisting of 50 words or more.
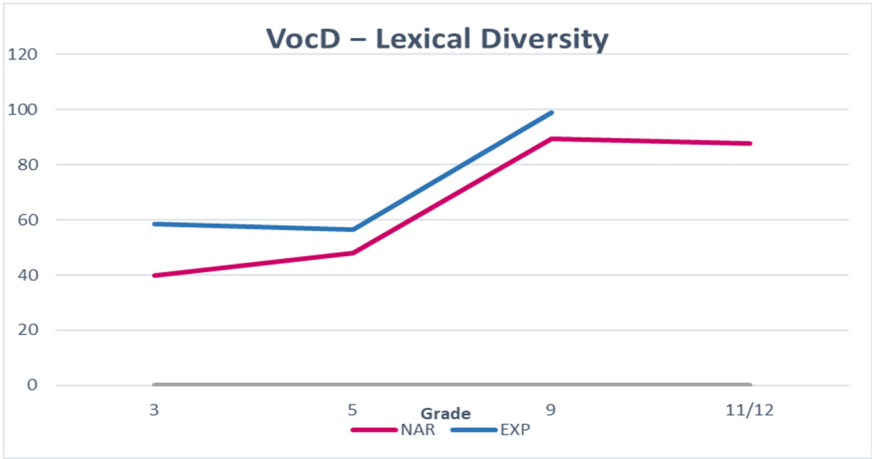

Figure 10.3
Average scores of lexical diversity in narrative and expository texts in Grades 3, 5, 9, and 11/12

As can be seen in Figure 10.3, a major developmental leap takes place somewhere in the longer interval between Grade 5 and Grade 9, which is where the only significant developmental difference is found (p = 0.000). The graph illustrates how the development as such seems to be unaffected by genre, although expository texts show greater variation in all age groups. Within age group, genre differences are significant in Grades 3 and 5 (p = 0.000 for both groups). In Grade 9, the difference of lexical diversity in narrative and expository texts was not significant. There were no significant gender differences in Grades 3 and 9, but in Grades 5 and 11/12 there were (both p = 0.000), with girls having a higher lexical diversity than boys in both groups. While the rounded p values end up the same, the pattern was more distinct in Grade 11/12.

10.2.1 Summary and discussion of the results for lexical diversity

In this study lexical diversity increases with age, the major development, again, occurring somewhere between Grades 5 and 9. There are significant genre differences in Grades 3 and 5, expository texts showing a greater diversity than narrative texts. While this is the case in Grade 9 as well, the difference is not significant. There are no conclusive gender differences. Johansson's (2009) study mirrors the results of the current study in that there is a great developmental leap between the ages of 13 and 17 years. Johansson's study does not reveal any gender or genre differences.

According to Jarvis (2013) lexical diversity is an aspect of linguistic intricacy reflecting the complexity of the language user's internal language system. The level of lexical diversity a person uses has an effect on the listener or reader, which makes it an inherently perceptual phenomenon, albeit with measurable properties. Sometimes, the term lexical diversity has been used synonymously with the notion of lexical richness (e.g., Daller, van Hout & Treffers-Daller, 2003; Laufer & Nation, 1995; Vermeer, 2000). In this thesis, lexical richness is viewed as a broader concept, of which lexical diversity is a part. Other aspects of lexical richness proposed by Read (2000) are lexical sophistication, number of errors, and lexical density. In other words, lexical richness not only depends on how many different word types are used in a text, but also on how these words are used. Viewed through that lens, the research in this thesis studies aspects of lexical richness in the analyses of adjective and noun meanings.

10.3 Number of adjectives

Adjective density is the number of adjective tokens divided by the total number of word tokens, showing the proportion of adjectives in relation to the total number of words

in a text. Figure 10.4 shows that in the narrative genre, the number of adjectives is steadily increasing across the three grades in which narrative texts are written. The differences from one grade to the next are significant (p = 0.000 for all grades). The number of adjectives in the expository texts shows a different pattern, almost indicating a U-shaped curve. Adjectives are decreasing not only between Grades 3 and 5 (p = 0.009) where it would be expected due to the adjective-heavy expository topic in Grade 3, but also between Grades 5 and 9 (p = 0.000). This may also be due to topic. However, between Grade 9 and Grade 11/12 the number of adjectives rises somewhat again, the difference being significant (p = 0.000).

The percentage of adjectives is consistently higher in the expository genre, but while the difference is significant in Grades 3 and 5, it is not in Grade 9. The results show no gender differences in any grade. In Grades 3 and 5 there are great genre differences (p = 0.000 in both grades); in Grade 9, however, these differences do not persist (p = 0.103).
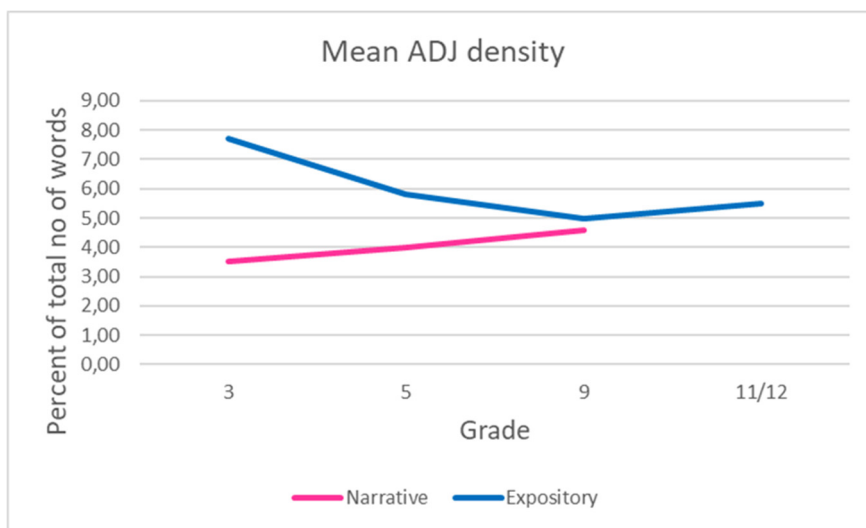
Figure 10.4
Average scores of adjective density in narrative and expository texts in Grades 3, 5, 9, and 11/12

Figure 10.4 shows the gradual increase of adjective use in the narrative genre from Grade 3 to Grade 9. The developmental curve for the expository genre shows a different pattern, with a decrease of adjectives between Grades 3 and 5 and Grades 5 and 9. The developmental trend of the adjective rate in the expository genre between Grades 9 and 11/12 looks very similar to the development of the adjective rate in the narrative genre, albeit slightly higher.

While Figure 10.4 shows the development of adjective use, Figure 10.5 highlights the high individual differences, particularly in the lower grades. Interestingly, there are no outliers in Grade 3 narrative text production. Speculatively, this may be the result of the topic concerning animals and emotions eliciting a more even adjective usage across students.
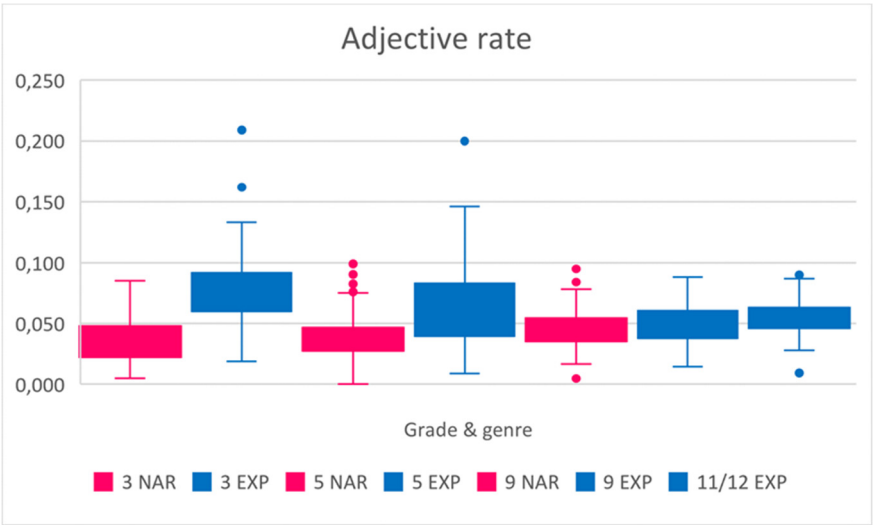
Figure 10.5
Outliers in relation to average number of words per sentence in narrative and expository texts in Grades 3, 5, 9, and 11/12

Table 10.3 shows an overview of the 10 most frequently used adjectives in every age group and how many times they occurred. Since the amount of data differs between the groups, comparisons of the number of occurrences can only be made between different adjectives in the same grade, not between grades for a specific adjective. While all the adjectives in the table are common in everyday language use, it also important to remember that they are evoked by the topics the students are writing about.

Table 10.3
Ten most common adjectives and number of occurrences in Grades 3, 5, 9, and 11/12

Grade 3	count	Grade 5	count	Grade 9	count	Grade 11/12	count
arg angry	204	*bra* good	165	*bra* good	154	*stor* big	211
rädd afraid	126	*stor* big	130	*rädd* afraid	141	*bra* good	207
glad happy	116	*liten* little/small	118	*hel* whole	119	*många* many	135
osäker insecure	55	*rolig* amusing	108	*stor* big	111	*olika* different	128
stor big	28	*kul* fun	93	*trött* tired	70	*annan* other	123
liten small/little	27	*viktig* important	71	*liten* small/little	68	*ny* new	98
jätterädd very afraid	26	*fin* nice	68	*ny* new	67	*kränkt* insulted	85
vanlig common/usual	23	*gammal* old	54	*mörk* dark	62	*hel* whole	78
nästa next	22	*ny* new	54	*fler* more	60	*olika* different	72
olika different	21	*andra* other	52	*många* many	60	*fler* more	72

All the adjectives in Table 10.3 occur in all age groups. However, the frequencies differ greatly between groups. *Angry* and *scared*, the two most common adjectives in 3rd grade (no doubt due to the topic), are not as common in the other age groups. *Big*, *good*, and *new* are among the ten most common adjectives in all except the youngest age group. *Whole*, *many*, and *more*, which are all schematically biased adjectives, are among the 10 most common adjectives in the two oldest age groups.

10.3.1 Summary and discussion of number of adjectives

The number of adjectives in proportion to the total number of words increases steadily with each grade in narrative texts, while the pattern for expository texts is a decrease until Grade 9 and an increase between Grades 9 and 11/12. In all age groups expository texts contain more adjectives than the narrative texts. The very high number of adjectives in Grade 3 expository texts is explained by the topic. In their texts about 'The language of animals', the students were instructed to write about how animals express emotions and their texts thus contain a high number of adjectives, such as *happy*, *sad*, and *angry*. It seems likely that the high number of adjectives in Grade 5 is also due to the topics they are writing about. For example, describing their dream hut, a treasure, or an event they remember, may elicit more adjectives than average use. Although girls

generally write longer texts then boys, there were no gender differences with regard to the proportion of number of adjectives produced.

In early language acquisition (i.e., pre-school), adjectives are produced later and are less frequent than nouns and verbs (Nelson, 1973; Gentner, 1978; Dromi, 1987; Jackson-Maldonado, Thal, Marchman, Bates, & Guiterrez-Clellen, 1993; Gasser & Smith, 1998; Mintz & Gleitman, 2002). As discussed in section 8.3.5, the cognitive process of conceptually integrating the adjective and noun meaning is proposed to be the reason for the development of adjective use. This development is expected to be reflected in written production as well. While students in Grades 3 and 5 make use of a wide range of adjective meanings, not only when speaking, but also in writing, it is expected that they do so less frequently than older students. It seems reasonable that the cognitive demand of the writing process leads the younger students to make both conceptually and structurally simpler choices. In the words of Ravid and Levie (2010, p. 29): 'From a point of view of linguistic complexity (Ravid, 2004), the interdependence between nouns and adjectives suggests that syntactic and lexical knowledge may pace each other in learning to deploy them in discourse (Ravid & Cahana-Amitay, 2005). Thus, the higher the occurrence of nouns and adjectives in a text, the higher the complexity of the syntactic architecture that frames them (Ravid & Berman, 2010; Ravid, van Hell, Rosado, & Zamora, 2002) — meaning that expository texts, the habitat of complex syntax, should contain more adjectives.'

11   Nominal meanings

To remind the reader: in this thesis the terms *nominal meaning* and *noun* are interchangeable and used in a broad way, i.e., not only lexical nouns, but also noun phrases, proper names, and pronouns were annotated as nouns. They are analysed with regard to ontology (i.e., level of abstraction) and concrete meanings are furthermore analysed with regard to domain. The results are presented in this chapter. Since no consistent genre or gender differences were found, these are not presented.

11.1 Noun ontology

As presented in section 3.2, Lyons (1977, pp. 442–445) proposes an ontology of noun meanings based on three different categories. Paradis (2005) adopted and refined the proposed ontology in the LOC model, which forms the methodological framework for the semantic annotation of adjective and noun combinations in this study.

Figure 11.1 presents the proportions of 1st, 2nd, and 3rd order meanings of all texts in each of the four grades. It is apparent from this figure that 2nd and 3rd order meanings are uncommon in the texts written by students in Grade 3. As can be seen, 1st order meanings representing concrete entities that exist in time and space dominate in all age groups, albeit steadily decreasing from constituting 90% of meaning type in Grade 3 to 50% in Grade 11/12. ANOVA shows that the decrease of 1st order meanings is significant between all age groups (all p = 0.000). Between Grades 3 and 5 this decline is in favour of 2nd order meanings, while in Grades 9 and 11/12 the 3rd order meanings are increasing in proportion with the decline of 1st order meaning usage.

While 2nd order meanings are rare in Grade 3, they are the second biggest category in Grade 5 and the difference between Grades 3 and 5 is significant (p 0.000). Topics such as 'Something I remember' and 'Try something new' and 'An excursion', not surprisingly, elicit 2nd order meanings, especially in the domains of EVENT and ACTIVITY. From Grade 5 and upwards the proportion of 2nd order meanings remains at approximately 20%.

Third order meanings are uncommon in Grades 3 and 5 and there is no significant difference between the groups. The use of 3rd order meanings increases somewhere between Grades 5 and 9 (p 0.000), but as can be seen in Figure 11.1, the biggest increase is observed between Grade 9, where they constitute 11%, and 11/12 where they constitute 30% (p 0.000). In Grade 11/12, 3rd order meanings make up the second biggest category after 1st order meanings.
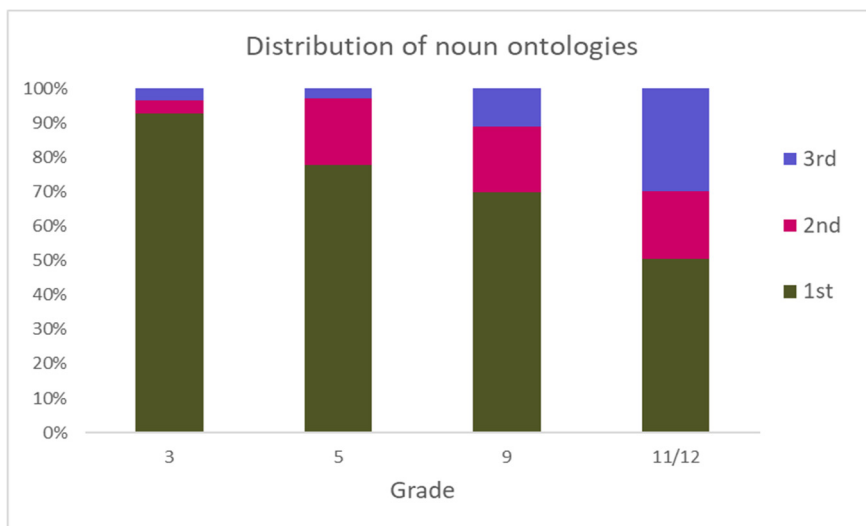
Figure 11.1
Average distribution of 1st, 2nd, and 3rd order meanings in Grades 3, 5, 9, and 11/12

In the LOC model, meanings to do with time (e.g., *hour*, *day*, *tomorrow*) are part of 3rd order meanings. However, since even the students in the youngest age group are familiar with and comfortable using and modifying meanings to do with time, this categorization turned out to produce misleading results. When meanings to do with time were categorized as 3rd order meanings, one could get the impression that the younger age groups used a broader range of abstract meanings far more than they did, when a closer look revealed that many of these meanings were related to time. Therefore, meanings to do with time were categorized separately. Examples of adjective meanings to do with time were *early*, *late*, *delayed*, and *postponed*. Figure 11.2 shows the distribution of noun ontologies in the different grades including meanings to do with TIME, here labelled 4th order meanings. The higher proportion of meanings to do with time in Grade 9 is topic-related, as one of the topics proposed the reform of school times to later in the day, an adjustment meant to make allowance for the sleeping patterns of teenagers – a topic that naturally evoked a high number of meanings to do with time.
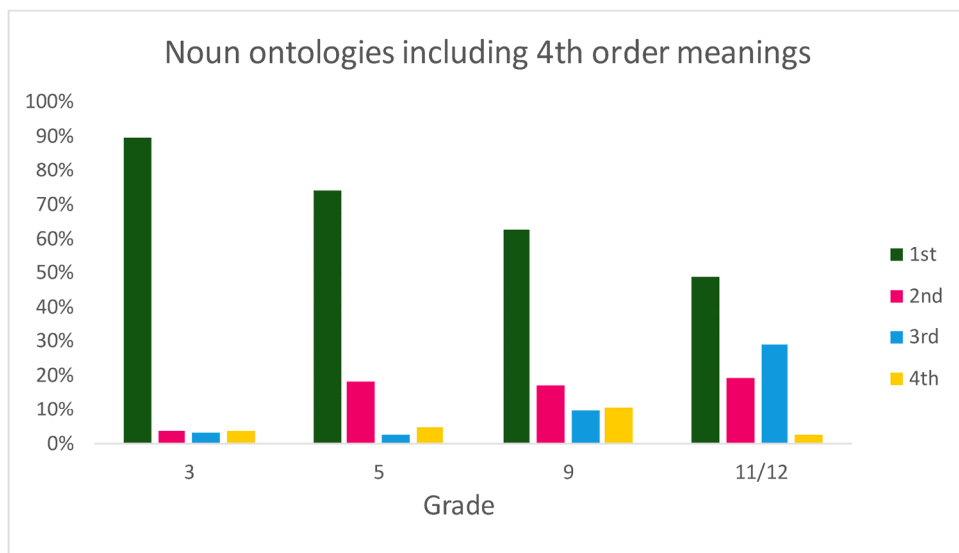
Figure 11.2
Average distribution of 1st, 2nd, and 3rd, and 4th order meanings, i.e., meanings to do with time, in Grades 3, 5, 9, and 11/12

Table 11.1 provides a range of examples of typical 1st, 2nd, and 3rd order nominal meanings in the different grades. Meanings were not annotated with regard to aspects such as genericity or register, nor the narrator's directness or involvement with a meaning or referent, but a closer look at the meanings used in different grades as the examples in table 11.1, suggest differences with regard to such aspects. In Grades 3 and 5 (however, with the exception of meanings to do with animals in Grade 3 expository texts) meanings referred to are often close to home to the narrator. First order meanings to do with ARTEFACTS or ANIMALS commonly refer to objects or pets in the possession of the narrator, events and sports expressed by 2nd order meanings are generally experienced or practised by the writer, and the same applies to 3rd order meanings referring to things like dreams, nightmares, memories, and ideas. Meanings expressed from the corresponding ontologies in Grades 9 and 11/12 are often more generic and higher in register. First order meanings such as *lady* and *building* from Grade 9 would probably have been expressed by *woman* and *house*, by younger students. *People*, *products*, and *surroundings*, 1st order meanings used by students in Grade 11/12 are more generic than the 1st order meanings used by students in Grades 3 and 5 and, furthermore, do not imply the same closeness to the writer. The same seems to be true for 2nd order meanings, at least in Grade 11/12 where they express meanings such as *alcoholism*, *behaviour*, and *working life*. In Grades 9 and 11/12, 3rd order meanings are

also less close to home and more general, e.g., *alternative*, *argument*, and *decision* (Grade 9) and *responsibility*, *meaning*, and *assessment* (Grade 11/12).

Table 11.1
Examples of 1st, 2nd, and 3rd order nominal meanings in Grades 3, 5, 9, and 11/12

	Grade 3	Grade 5	Grade 9	Grade 11/12
1st	*häst* horse	*hund* dog	*dam* lady	*folk* people
	flicka girl	*familj* family	*byggnad* building	*produkter* products
	spöke ghost	*låda* box	*kläder* clothes	omgivning surroundings
	sak thing	sak thing	*sak* thing	*sak* thing
2nd	*kroppsspråk* body language	*sport* sport	*andetag* breath	*alcoholism* alcoholism
	leende smile	*bråk* fight	*rytm* rhythm	*arbetsliv* working life
	rädsla fear	*badminton* badminton	*fest* party	*beteende* behavior
	semester vacation	*fotboll* football	*händelser* events	*relationer* relationship
	val choice	*condition* fitness	*känsla* feeling	*förhållanden* conditions
		teknik technique	*lektion* lesson	*händelser* events
		skratt laughter	*erfarenhet* experience	*situationer* situations
		resa trip	*sätt* manner	*tillvägagångssätt* mode of operation
3rd	*film* film	*berättelse* story	*anledning* reason	*anledning* reason
	dröm dream	*idé* idea	*alternativ* alternative	*ansvar* responsibility
	mardröm nightmare	*minnne* memory	*argument* argument	*bedömning* assessment
	idé idea	*tips* tip	*beslut* decision	*betydelse* meaning
	språk language	*matchregler* match rules	*kontroll* control	*effekt* effect

11.1.1 Summary and discussion of the analysis of noun ontology

To recapitulate, there are three content structures in the LOC model, namely, CONCRETE PHENOMENA (1st order meanings), EVENTS, STATES, and PROCESSES/ACTIVITIES (2nd order meanings), and ABSTRACT PHENOMENA (3rd order meanings). Meanings to do with time were annotated in this study as 4th order meanings (cf. section 11.1). First order structures are meanings that denote physical objects and phenomena that exist in time and space, comprising domains such as ARTEFACTS, PEOPLE, ANIMALS, and PLANTS, represented by words such as *car*, *child*, *cat,* and *corn*. Physical objects are traditionally seen as prototypical for noun meanings (Lyons, 1968; Hopper & Thompson, 1984; Langacker, 1987b). The perceptual properties of 1st order entities are relatively constant, they exist in three-dimensional space, and they are publicly observable (Lyons, 1977; Paradis, 2005). In all grades and genres, 1st order meanings were the most common nominal meanings in adjective-noun combinations. These results coincide with the results of adjective and noun combinations analysed of adult (both spoken and written) data from the British National Corpus (Paradis et al., 2015).

Second order entities evoke phenomena that occur in time, rather than exist in space, primarily encompassing the domains of EVENTS (*party, football game, excursion*), STATES (*health, temperature, darkness*), and PROCESSES/ACTIVITIES (*production, growth, dance*). In Grade 3, 2nd order meanings are rare. There is no doubt that third graders are highly familiar with, and also could report about, EVENTS such as birthday parties, football games, or STATES such as being sick or tired. One would expect such things to be common topics of conversation around the family dinner table. On the other hand, one could speculate that both the expository topic of 'The language of animals' and the narrative topic of 'Fear' would be topics biased to elicit meanings to do with EMOTION, which are construed as 2nd order meanings, but these were rare. Meanings to do with emotions were almost exclusively construed as adjectives. In Grade 5 the number of 2nd order meanings has increased considerably. Evidently, some of the topics would be expected to evoke meanings within the domains of EVENT and ACTIVITY especially, meanings which are construed as 2nd order meanings. Interestingly, from Grade 5 and upwards, the proportion of 2nd order meanings remains the same and constitutes approximately 20% of all content structures, suggesting that the increase of 2nd order meanings is not only connected to topic, but that some developmental aspect may also be involved.

Third order entities denote completely abstract entities, defined neither by time nor space. They can be referred to as SHELLS and denote things such as *concepts*, *creation*, *council*, and *current*, i.e., concepts being part of domains such as LINGUISTICS, CIRCUMSTANCE, and IDEA. In both Grades 3 and 5 abstract concepts are extremely

rare. A developmental leap happens between Grades 5 and 9 and an even bigger developmental leap between Grades 9 and 11/12. In Grade 11/12, 3rd order meanings are the second most common meaning type. Other studies looking at noun development show a similar development, with abstract meanings increasing over the school years (Nippold, 2005a; Ravid, 2006; Ravid & Berman, 2010; Ravid & Cahana-Amitay, 2004; Sun & Nippold, 2012). Both Ravid's (2006) and Ravid and Berman's (2010) studies reveal a higher proportion of abstract nouns in expository texts. This difference is mirrored in Grade 9 in the current study, but not in the texts of the lower grades (which contain very few abstract meanings in both genres).

In summary, the results of this study show a steady increase of abstract meanings from Grade 5 and upwards. It seems reasonable to assume that a combination of cognitive development, schooling and expanded encyclopaedic knowledge increasingly provide older students with the resources needed to express abstract meanings. The proportion of 2nd order meanings, i.e., concepts denoting EVENTS and STATES, constitutes about 20% of all meaning structures in Grades 5, 9, and 11/12. Third order meanings do however increase with age, and they do so at the expense of 1st order meanings. Despite the increase of abstract meanings, 1st order meanings remain the most common meaning structures in all age groups. As mentioned above, the dominance of concrete meanings in adjective and noun combinations is also reflected in adult, both spoken and written, data (Paradis et al., 2015). It seems that although we have a growing ability to communicate about abstract concepts, concrete entities are still prevalent in our discourse. The next section takes a closer look at different 1st order noun meanings.

11.2 Nominal domains

All 1st order meanings were annotated with regard to domain, i.e., whether they represented meanings within the category of ARTEFACT, PEOPLE, BODY or BODY PARTS, COLOUR, ANIMAL, FOOD, LOCATION, NATURE, NATURAL OBJECTS/PHENOMENA, or PERCEPTION. It is important to remember that, evidently, the meanings in the texts are highly influenced by the topics the students were given. Figure 11.3 shows how the concrete 1st order noun meanings are distributed across the different domains.
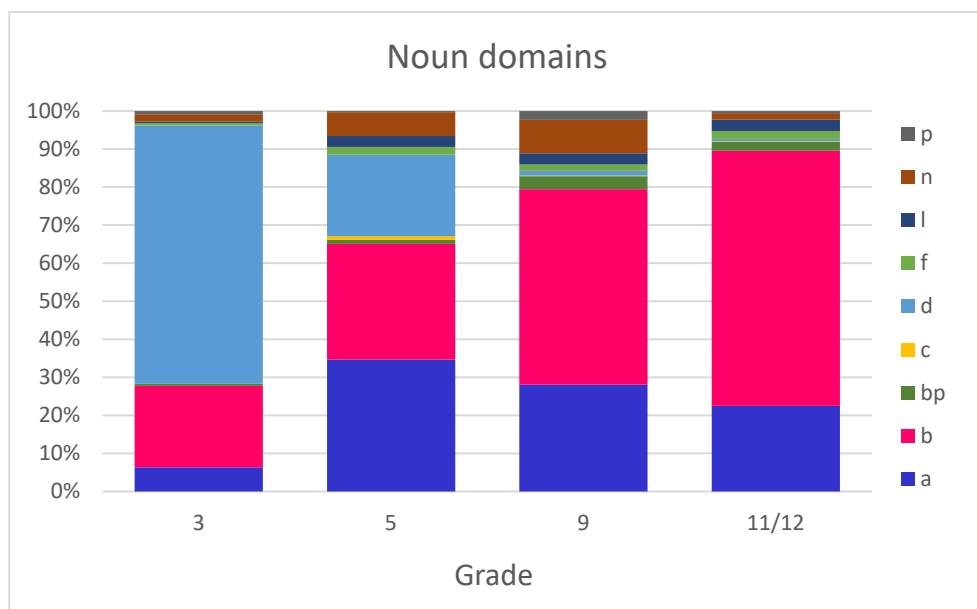
Figure 11.3
Average representation of the different 1st order nominal domains in Grades 3, 5, 9, and 11/12
Note. Noun domains a = artefact, b= to do with people, bp = to do with body or body parts, c = colour, d = animal, f = food, l = location, n = nature, natural objects/phenomena, p = perception

In Grade 3 the biggest block represents meanings to do with ANIMAL (68%). This dominance of noun meanings referring to animals in Grade 3 can be explained by their expository topic being 'The language of animals'. However, the number of meanings referring to animals is also one of the three biggest groups (21%) in Grade 5, too, many of them occurring in texts with the topic 'Something important', suggesting that animals are indeed important to children in the younger age groups. In the two older age groups, meanings referring to animals are rare. The two biggest categories in Grade 5, as well as in Grades 9 and 11/12, are meanings to do with ARTEFACTS and meanings to do with PEOPLE. While meanings to do with artefacts (35%) are slightly more common in Grade 5 than meanings to do with people (30%), in Grade 9 meanings to do with people constitute the largest category (51%, artefacts 28%) and by Grade 11 this category is dominant by far (67%, artefacts 23%). Although there are slight differences as to the proportions of occurrences in the remaining domains of BODY PARTS, COLOUR, FOOD, LOCATION, NATURAL OBJECTS & PHENOMENA, and PERCEPTION, the bar chart shows that there are, even if only a few occurrences, noun meanings from all categories in each age group. With one exception — in Grade 3 there are no meanings representing colour. This does not mean that there are no occurrences of colour terms at all in Grade 3, but the meanings to do with colour that do occur are

construed as adjective meanings and not as nouns. Meanings from the domain of nature, natural objects, and phenomena are more common in Grades 5 and 9 than in the youngest and oldest age groups. These meanings did not seem to be elicited specifically by any of the given topics, since they occurred over a wide range of subjects. Meanings from the domains of food and location are rare in Grade 3. From Grade 5 and upwards the proportions of meanings in these categories are almost identical. Meanings to do with perceptions and with body parts were rare in all age groups.

Table 11.2 shows typical examples of meanings from each grade and domain. With regard to meanings to do with PEOPLE, it is possible to observe a development from most meanings referring to people close to them to more general meanings, e.g., *mum* (Grade 3), *friends* (Grade 5), *people* (Grade 9), and *consumer* (Grade 11/12). Body-related meanings are represented by, for example, *face* and *body* in Grades 3 and 5 and by *organ* and *genes* in Grades 9 and 11/12. Meanings referring to ANIMALS do not change a lot over the years, except for one occurrence of the word *prey* used metaphorically in Grade 11/12. ARTEFACTS are represented by meanings such as *house* and *knife* in Grade 3, *building* and *computer* in Grade 5, *window* and *wreck* in Grade 9, and *pesticide* and *assortment* in Grade 11/12. Meanings to do with particular colours were most often construed as adjectives, but the noun *colour* occurred in Grades 5, 9, and 11/12. Nominal meanings to do with LOCATIONS are most often referred to as *places*, *cities*, and *countries*, although in Grade 11/12 there are also occurrences of meanings such as *workplace* and *living environment*. FOOD-related meanings do not change character and generally refer to meanings to do with foods commonly eaten in Swedish homes (e.g., *carrot* in Grade 3, *chocolate* (Grade 5) *cake* (Grade 9), and *bread* (Grade 11/12)). Other food-related expressions are *breakfast* and *dinner* (Grade 9). NATURAL OBJECTS & PHENOMENA are represented by meanings such as *stone* (Grade 3), *sunset* (Grade 5), *clouds* (Grade 9), and *fog* (Grade 11/12) and do not change character over the years (with the exception of *organism*, used once in Grade 11/12). Finally, meanings to do with PERCEPTION are mostly related to temperature and smell, they are uncommon, and they do not change over the school years.

Table 11.2
Examples of meanings from the different 1st order domains in Grades 3, 5, 9, and 11/12

Domain	Grade 3	Grade 5	Grade 9	Grade 11/12
People	*jag, vi, hon, mamma, bror*	*jag, vi, vänner, coach, familj*	*jag, vi, han, föräldrar, folk*	*jag, vi, hon, person, konsument, generation*
	I, we, she, mother, brother	I, we, friends, coach, family,	I, we, he, parents, people	I, we, she, person, , consumer, generation
Body related	*ansikte, ögon, fingrar, kropp*	*kropp, ansikte, tårar*	*kropp, hår, händer, organ*	*hjärna, gener*
	face, eyes, finger, body	body, face, tears	body, hair, hands, organs	brain, genes
Animals	*elefant, häst, gorilla*	*hund, katt, häst, kanin*	*djur, kattunge, fågel, skata*	*djur, hund, byte*
	elephant, horse, gorilla	dog, cat, horse, bunny	animal, kitten, bird, magpie	animal, dog, prey
Artefacts	*saker, hus, kniv*	*byggnad, dator,*	*lägenhet, fönster*	*bekämpningsmedel, bild, urval*
	things, house, knife	building, computer	apartment, window, wreck	pesticide, picture, assortment
Colour/Light	----	*färg*	*färg, ljus*	*färg, hudfärg*
		colour	colour, light	colour, skin colour
Location	*platser, ö*	*platser, stad, länder,*	*platser, omgivningar*	*platser, arbetsplats, boendemiljö*
	places, island	places, city, countries	places, surroundings	places, workplace, living environment
Food	*morot, apelsin, korv*	*choklad, pizza, mandlar*	*mat, frukost, kaka*	*banan, bröd, mjölkprodukter*
	carrot, orange, sausage	chocolate, pizza, almonds	food, breakfast, cake	banana, bread, dairy product
Natural objects & phenomena	*sten, djungel*	*kulle, mossa*	*himmel, ljus, luft*	*planet, stjärna, organism*
	stone, djungel	hill, moss	sky, light, air	planet, star, organism
Perceptions	*temperature*	*lukt*	*lukt, värme*	
	temperature	smell	smell, varmth	----

11.2.1 Summary and discussion of the results for nominal domains

To make sense of word meanings/concepts, they need to be viewed in a specific context. This context is made up of all the background knowledge we have about the concept and is organized in what Langacker (1987a) calls DOMAINS. In other words, the notion of domains and domain matrices is a model of how we categorize meanings (see chapter 6 for a more detailed account of DOMAINS). The students wrote their texts on a wide range of different topics and the domains represented in each text are heavily influenced by the topic. Despite this, it has been possible to recognize some interesting developmental patterns which seem to be more general.

First of all, while the proportions differed, all the 1st order domains, with one exception, were represented in all age groups (to remind the reader, these are all domains with concrete meanings). The one exception was the nominal domain of COLOUR, but in Grade 3 meanings to do with colour were construed only as adjective meanings. This shows that by third grade all the concrete domains are firmly established, a result which was to be expected.

In the two younger age groups, that is, not only in Grade 3 where the expository topic was related to animals, but also in Grade 5 where this was not the case, the domain of ANIMAL was richly represented. In Grades 5, 9, and 11/12 the two most frequently represented domains were ARTEFACT and PEOPLE. Interestingly, the proportions shift gradually from meanings to do with things, i.e., the ARTEFACT domain, to meanings to do with PEOPLE becoming more and more common, and by far dominant by Grade 11/12. I would suggest that meanings to do with people often are more complex than meanings to do with objects and would consequently propose that even if 1st order meanings are dominant in the higher grades, too, there is still a development in complexity over the school years.

12 Adjective meanings

Unlike nouns, which are construed as THINGS, adjectives are RELATIONS (Langacker, 1987a, b). In this study they are analysed with regard to domain, schematicity, constructional use, scalarity, and function. The results are presented in this chapter. Since no consistent genre or gender differences were found, these are not presented.

12.1 Adjective domains

The sheer number of adjective domains, and the fact that the adjective meanings are evoked in the specific context of different topics, render a statistical analysis meaningless. It is, however, still interesting and meaningful to look at how the variation develops over time and how they may differ in relation to the nominal domain. The pie charts in Figure 12.1 provide a visual impression of development and variation in the adjectives modifying nouns from the two most common nominal domains, namely, ARTEFACTS and PEOPLE. The charts are too detailed to be read on an individual level, but looking at them together, one can see that there is a development of a wider range of domains represented in the higher grades. In Grade 3, the limited spread might be a result of the students only writing on two different topics. From Grade 5 and upwards the students had a range of topics to choose from, which is at least part of the reason why there are meanings from a greater number of domains represented in the higher grades.

While it may be difficult to make a detailed comparison, it is possible to see some similarities and differences between the ARTEFACTS and PEOPLE domains. Meanings from the domain of DEMEANOUR & DISPOSITION commonly modify nouns to do with both PEOPLE and ARTEFACTS. Meanings such as *naïve*, *criminal*, and *stubborn* describe people, and meanings such *practical*, *strange*, and *awful* describe things (and could describe people as well). Also common in modifying meanings from both the ARTEFACTS and PEOPLE domains are adjectives to do with AGE/NEWNESS. Colour terms are frequently used to describe objects in all grades, except in the oldest group, where they are rare. In the PEOPLE domain, the same is true for bodily related meanings (such as *toothless*, *drunk* and *sweaty*), which are common in all grades except 11/12. The most common meanings modifying nouns to do with people in all grades are related to EMOTION.
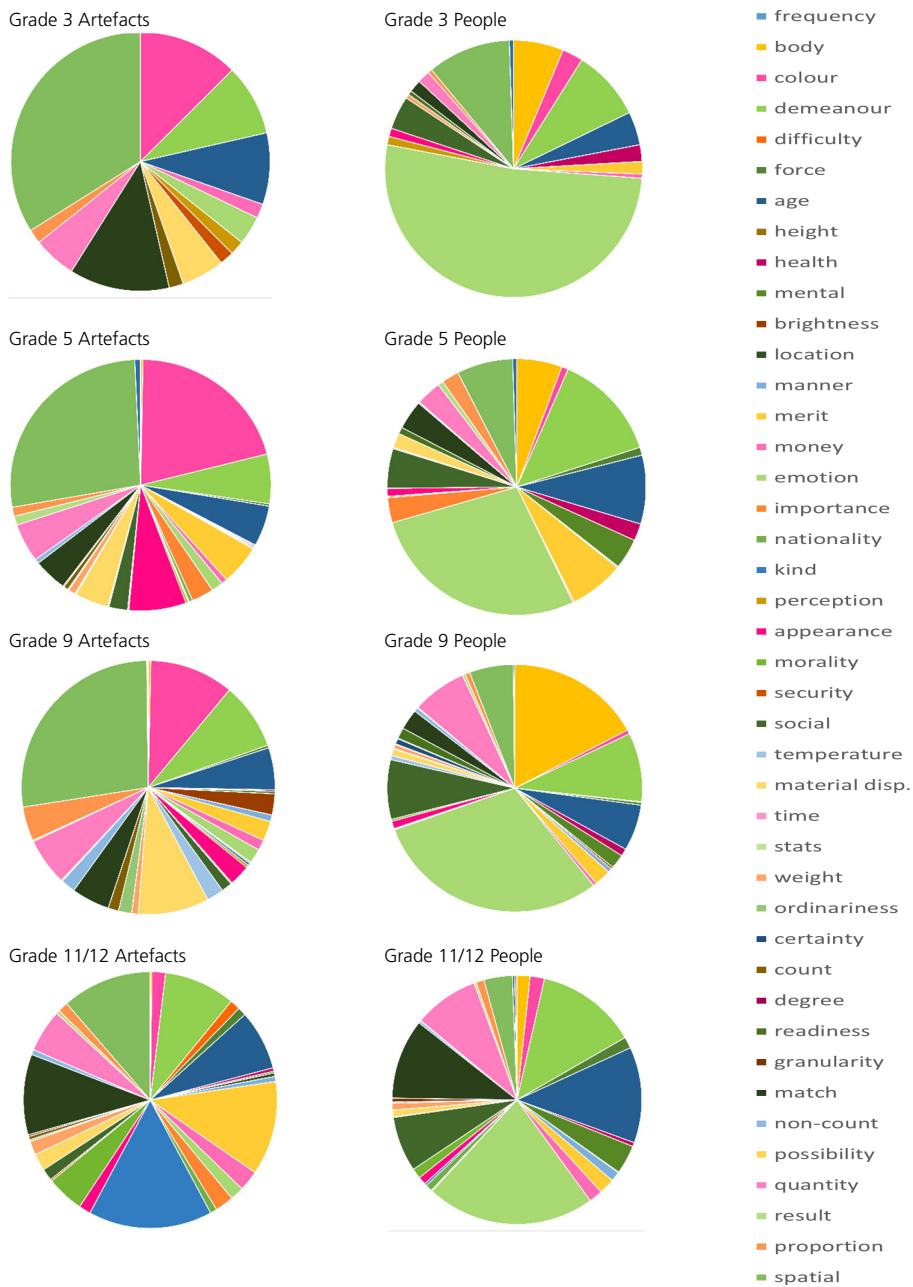
Figure 12.1
Average representation of the different adjective domains modifying meanings to do with ARTEFACTS and PEOPLE in Grades 3, 5, 9, and 11/12.

Table 12.1 shows typical examples of meanings from each grade and seven common adjective domains. Meanings to do with APPEARANCE, are similar across the different age groups, mostly expressing meanings to do with good and bad looks, such as *pretty girls* (Grade 3), *mangy bunnies* (Grade 5), *ugly jeans* (Grade 9), and *beautiful people* (Grade 11/12). In the other domains there is a visible development in register between the two lower and the two higher grades, as well as a development towards more abstract meanings. In the domain of DEMEANOUR & DISPOSITION the youngest students often express meanings to do with kindness or unkindness, such as *stupid grandfather* and *kind man*, in Grade 5 a girl describes her cat as being *mischievous*, whereas the students in the two oldest grades frequently express more abstract meanings and meanings not only pertaining to themselves or a particular individual, but things and people on a more generic level (e.g., *cold-hearted people* in Grade 9, and *serious dilemma* in Grade 11/12). Common meanings expressed within the domain of EMOTION in the younger grades are to do with the states of being happy or sad, and in the older grades students also express meanings to do with feelings such as nervousness, frustration, and pessimism. Within the domain of MERIT *good* and *bad* are common in all grades, but the students in the two highest grades show some variation, such as *lower quality* (Grade 9) and *positive impact* (Grade 11/12). There were no occurrences of meanings to do with MORALITY (i.e., meanings to do with RIGHT and WRONG) in Grade 3, the reason probably being the limited topics they wrote about. *Right* and *wrong* were most commonly used in all grades, although in Grade 11/12 there was some variation, such as *unacceptable behaviour* and *incorrect registration*. The SOCIAL domain encompassing meanings to do with people in relation to other people had only a few (9) occurrences in Grade 3, all of them expressing the meaning of *alone*. In addition to *alone*, *secret*, *well known*, and *popular* are meanings that occurred several times in Grade 5. As in several of the domains mentioned above, meanings in this domain become more abstract and partly more generic, in the two higher grades. *Unfamiliar boy* and *social life* are examples from Grade 9 and in Grade 11/12 meanings such as *humiliated teenagers* and *anonymous man* were expressed. In Grade 3 there were no occurrences of meanings expressing IMPORTANCE, while in Grade 5 the meanings expressing importance were very personal, such as *my dog is important to me* and *my dad is important to me*. Again, in Grades 9 and 11/12 the meanings expressed become more abstract and impersonal. Examples from Grade 9 are *important questions* and *the most necessary law*, and examples from Grade 11/12 are *serious causes* and *the most important arguments*.

Table 12.1

Examples of adjectives from 7 domains modifying nouns in Grades 3, 5, 9, and 11/12

Content domain	Grade 3	Grade 5	Grade 9	Grade 11/12
Apperance	*snygga tjejer* pretty girls	*gulligaste katten* cutest cat	*fula jeans* ugly jeans	*osynliga diset* invisible haze
	svartklädd man black dressed man	*skabbiga kaniner* mangy bunnies	*blänkande skenet* gleaming light	*vackra människor* beautiful people
Demeanor & Disposition	*dumma morfar* stupid grandfather	*jag är intresserad* I am interested	*känslokalla människor* cold hearted people	*naiva personer* naïve persons
	snäll man kind man	*hon är busig* she is mischievous	*korkade beslut* stupid decision	*allvarligt dilemma* serious dilemma
Emotion	*Lina blev jätterädd* Lina got very scared	*jag blev jätteglad* I got very happy	*jag var nervös* I was nervous	*frustrerande tonårsproblem* frustrating teenage problems
	en glad häst a happy horse	*boken är förvirrande* the book is confusing	*oroväckande känsla* worrying feeling	*pessimistisk hjärna* pessimistic brain
Merit	*vilken bra idé* what a good idea	*fotboll är en fantastisk sport* soccer is a fantastic sport	*bra initiative* good initiative	*positive inverkan* positive impact
	hästar är fina horses are beautiful	*bra kommentarer* good comments	*sämre kvalitet* lower quality	*dåliga influenser* bad influences
Right / wrong		*kryss blev rätt position* cross was the right position	*felaktigt beslut* wrong decision	*oacceptabelt uppträdande* unacceptable behaviour
Social	*han var ensam hemma* he was home alone	*en popular sport* a popular sport	*ett social liv* a social life	*förnedrade tonåringar,*
		en hemlig koja a secret hut	*en främmande kille* an unfamiliar boy	*humiliated teenagers*
Importance		*min hund är viktig* my dog is important	*viktiga frågor* important questions	*allvarliga orsaker* serious causes
		min pappa är viktig för mig my dad is important to me	*nödvändigaste lagen* the most necessary law	*de viktigaste argumenten* the most important arguments

Note. Adjectives are shown in combination with the noun they modify. It is in context, in the interaction with the noun that the adjective meaning and configuration is determined.

12.1.1 Content versus schematic domains

The adjective domains fall into two types, content-biased and schematically biased. Domains with adjectives modifying, for example, degree, frequency, and quantity belong to the schematic domains, as do meanings to do with similarity (MATCH/NON-MATCH) (see the full list in section 4.1.2) Furthermore, adjectives expressing epistemic meanings belong to this category. Figure 12.2 shows that while, as to be expected, adjectives from content domains are dominant by far in all age groups, the proportion of schematically biased meanings steadily increases with each grade.
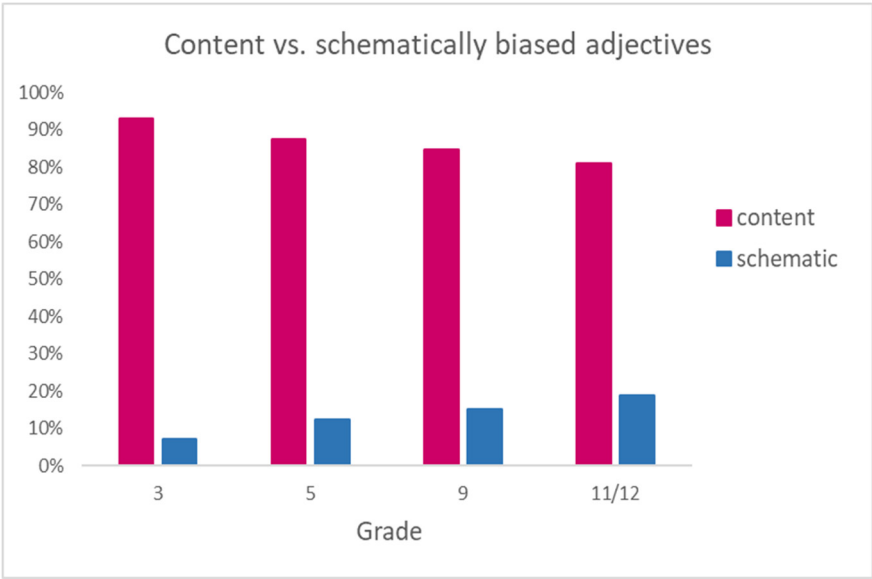
Figure 12.2
Average proportions of content vs. schematically biased adjective in Grades 3, 5, 9, and 11/12

The pie charts in Figure 12.3 show the distribution of the schematically biased domains only. They show that adjective meanings expressing QUANTITY (*many*, *more*, *several*), MATCH/SIMILARITY (*similar*, *different*, *alike*), and proportions (such as whole and half, e.g., *the whole world*) are the most common in all age groups, but also that the range of meanings from different schematic adjective domains increases over the school years. In Grade 3 six different schematic domains are represented, nine in Grade 5, ten in Grade 9, and thirteen in Grade 11/12.
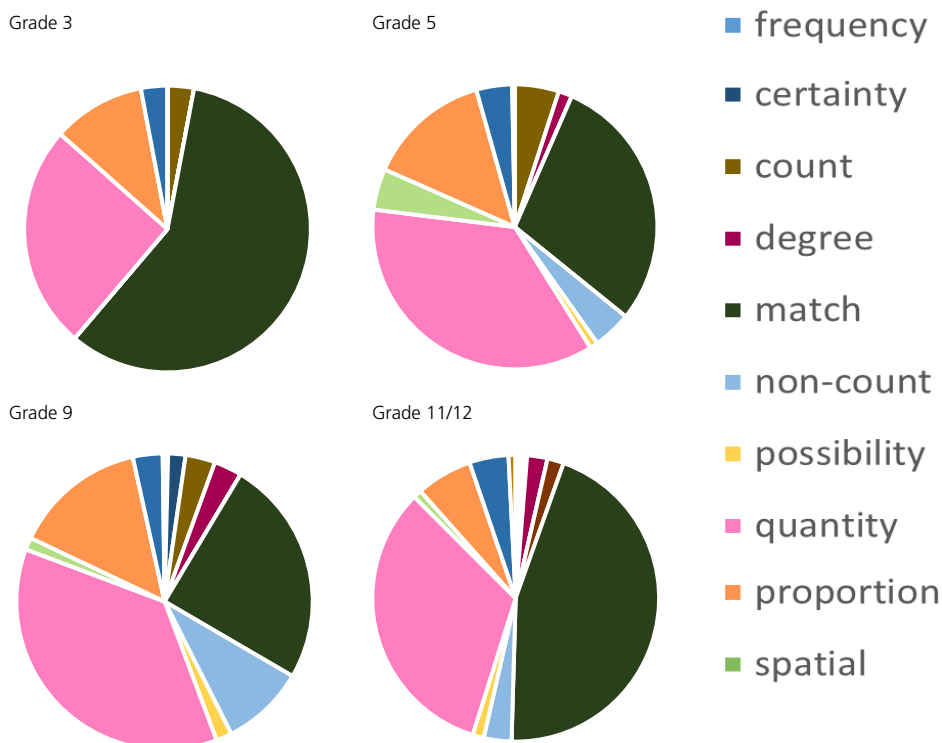
Figure 12.3
Average representation of the different schematic adjective domains modifying meanings to do with ARTEFACTS and PEOPLE in Grades 3, 5, 9, and 11/12.

Table 12.2 provides examples from each grade and different schematic domains. The texts in Grade 3 did not contain any expressions of DEGREE, which I attribute to the topics they are writing about rather than any inability to understand or produce expressions of degree. However, expressions of degree were rare in Grade 5 as well. The five occurrences all referred to EVENTS such as *heavy snowstorm* (which is metaphorical) and *extreme energy boost*. In Grade 9, expressions of degree commonly modified EVENTS and EMOTIONS, as in *a certain fear* and *heavy injuries*, where metaphorical *heavy*, again, is used to express a degree of severity. Examples from Grade 11/12 are *total humiliation* and *marked difference*, where *marked difference* is one of the few modifications of degree of a 3rd order meaning.

The use of concepts from the domains of PROPORTION, QUANTITY, and COUNTING is not changing very much over the school years. This I explain by the fact that these constitute the kind of schematic meanings that are quite set and not as malleable as most other meanings. *Whole* and *half*, for example, are the most common meanings used in the domain of PROPORTION. As the examples in table 12.2 illustrate, these

meanings are used in much the same way throughout the school years. They are commonly used to describe how much of a whole object, substance, or time period is consumed, spent, needed, or participating in the particular situation. Typical examples are *whole family* (Grade 3), *half the bed* (Grade 5), *the whole day* (Grade 9), and *the whole internet* (Grade 11/12). *More*, *many*, and *less* are the meanings most commonly expressed in all grades to refer to meanings to do with QUANTITY, and *first* and *second* are the most frequent, in all grades, in the domain of COUNTING. In the domain of NON-COUNTING, *next* and *last* are the most frequent expressions in all grades, although with some variation in the two higher grades with meanings such as *coming generation* (Grade 9) and *the remaining hours* (Grade 11/12).

The epistemic domains of TRUTH, CERTAINTY, and POSSIBILITY show somewhat more variation. Only meanings from the domain of TRUTH are represented in all four grades. *True* and *not true* are the most common ones, but *false* and *real* (as in *authentic*) are also meanings that occur. CERTAINTY, as in *I am certain* (Grade 9) and *Are you sure?* (Grade 11/12) are the only meanings represented from the domain of TRUTH (both sure and certain expressed by *säker* in Swedish) and only occur in Grades 9 and 11/12. The domain of POSSIBILITY is mainly represented by the meanings *possible* and *impossible* in all grades except Grade 3 where there are no occurrences relating to POSSIBILITY. GRANULARITY is expressed explicitly only in Grade 11/12 (where it is also rare), for example in *society's general ethics and morality*.

Meanings to do with MATCH and NON-MATCH are expressed with *same*, *different*, *similar*, and *other* in all four grades. Adjectives such as *next*, *last*, *coming* (all grades), but also *previous* (Grade 11/12) were the common expressions from the domain of TIME SCALE. Finally, meanings to do with RESULT were most commonly expressed with *finished*, in all grades, except Grade 3 where there were no occurrences related to this domain.

Table 12.2

Examples of schematically biased adjectives modifying nouns in Grades 3, 5, 9, and 11/12

Schematic domain	Grade 3	Grade 5	Grade 9	Grade 11/12
Degree		*kraftig snöstorm* heavy snowstorm *värsta energikicken* extreme energy boost	*en viss rädsla* a certain fear *svåra skador* heavy injuries	*total förnedring* total humiliation *markant skillnad* marked difference
Proportion	*hela familjen* the whole family *hela natten* the whole night	*delad etta* shared first place *halva sängen* half the bed	*hela dygnet* the whole day *hela flaskan* the whole bottle	*hela skolåret* the whole school year *hela internet* the whole internet
Quantity	*mer morötter* more carrots *många skuggor* many shadows	*många vänner* many friends *mer information* more information	*mindre tid* less time *enstaka person* occasional person	*många människor* many people *mindre aktivitet* less activity
Counting	*andra varvet* second lap *andra hålet* second hole	*första ögonkaset* first glance *andra dagen* second day	*första lektionen* first lesson *andra våningen* second floor	*andra numret* second act *andra chanser* second chances
Non-counting	*nästa natt* next night	*nästa match* next game *sista dagen* last day	*kommande generation* coming generation *sista tiden* recent times	*resterande timmarna* the remaining hours *nästa factor* next factor
Truth	*det var inte sant* it was not true *en riktig skojare* a real crook	*riktiga tavlor* real paintings *äkta stenar* genuine diamonds	*sann historia* true story *falskt alarm* false alarm	*verkliga livet* real life *sann händelse* true event
Certainty			*jag är säker* I am certain	*är du säker* are you certain
Possibility		*det är omöjligt* it is impossible	*8 av 50 möjliga* 8 of 50 possible	*bästa möjliga resultat* best possible result
Granularilty				*samhällets generella etik och moral* society's general ethics and morality
Match/non-match	*en annan elefant* another elephant *olika språk* different languages	*andra tricks* other tricks *olika ställen* different places	*andra orsaker* other reasons *olika sätt* different ways	*liknande program* similar programs *man tror att alla är likadana* You think that everyone is the same
Time scale	*nästa dag* next day *nästa kväll* next evening	*nästa dag* next day *förra sommaren* last summer	*kommande veckan, förra vintern* the coming week, last winter	*dåvarande rektor* former principal *blivande förtryckare* future oppressors
Result		*kojan blev klar* the hut was finished	*jag blev färdig först* I finished first *vi var redo* we were ready	*råbomullen till det färdiga plagget* the raw cotton for the finished garment

Note. Adjectives are shown in combination with the noun they modify. It is in context, in the interaction with the noun that the adjective meaning and configuration is determined.

12.1.2 Summary and discussion of the adjective domain results

Students in Grade 3 used meanings from fewer domains than the students in the higher grades. While there is the possibility and even probability of some developmental aspect (or limited encyclopaedic knowledge) affecting the range of domains, it is also important to remember that the youngest students only wrote essays on two different topics — both of which were heavily biased towards meanings to do with emotions. Despite that, 13 different content domains were represented in the texts written by Grade 3 students. The results of the use of meanings from the schematically biased domains show a clearer developmental trend. It is not only the use of content-biased adjectives that increases over the school years but also the range of uses from different schematic domains. Meanings from the domains of MATCH/SIMILARITY and QUANTITY constitute the two biggest categories. Meanings to do with truth occur in all grades, while meanings to do with possibility and certainty only occur in the higher grades (where they remain rare). The use of epistemic adjectives in the higher grades could indicate another aspect of the development towards expressing increasingly abstract meanings.

12.2 Constructional use

Adjectives were annotated with regard to their position, i.e., if they were used attributively or predicatively. Figure 12.4 shows the distribution of adjectives in attributive and predicative position. While the trend is a steady increase in attributive uses, the results indicate two more pronounced phases of development from predominantly predicative uses to predominantly attributive uses. The first one occurs between Grades 3 and 5 and the second one between Grades 9 and 11. There are significantly more adjectives in attributive position in Grade 5 than in Grade 3 (p = 0.000), the difference between the larger age gap of Grades 5 and 9 is not significant, while the difference between Grades 9 and 11 is significant again (p = 0.000).
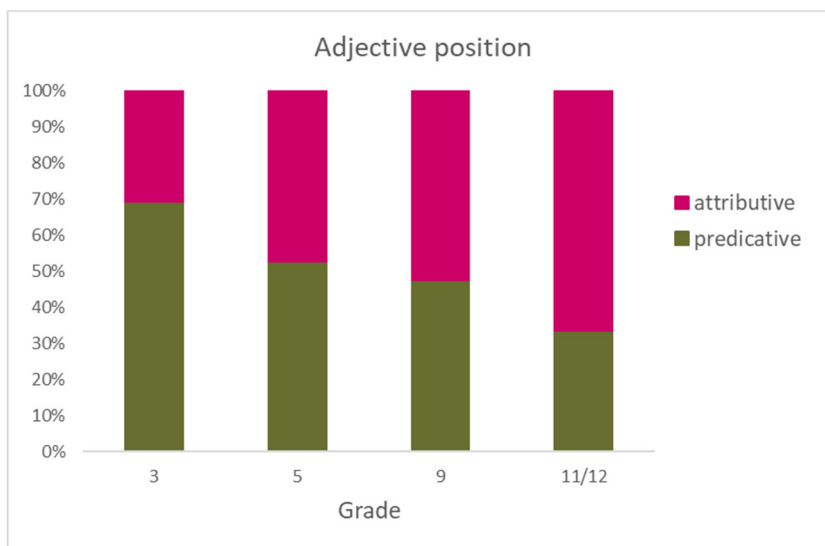
Figure 12.4
Average distribution of adjectives in attributive and predicative position in Grades 3, 5, 9, and 11/12

Adjective function imposes the use of a particular construction, and it is only in the function of specification/description that the choice between attributive and predicative is (almost always) free (see section 4.4). Therefore, I took a closer look specifically at the adjective position in specifications, which showed that when adjectives were used specifying/describing a nominal meaning they were used attributively between 14% and 18% in all grades. These results mean that the increase in attributive uses in the higher grades is due to the increase of using adjectives in the kind-identifying/classifying function.

12.2.1 Construction and adjective domains

On account of the suggestion that adjective type, i.e., type of adjective meaning determines adjective position (Nelson, 1976; Saylor, 2000), I looked more closely at the distribution of attributive and predicative position in the six prevailing domains of the data. Three of these domains are schematicity biased domains, representing meanings to do with SPATIAL MEANINGS, MATCHING (similarity), and QUANTITY. The other three are content-biased, more specifically meanings to do with EMOTIONS, MERIT, and DEMEANOUR & DISPOSITION.

The results are illustrated in Figure 12.5. The width of the column for each grade is proportional to the number of observations, that is, the number of adjectives analysed

from the respective grade. Within the column for each grade, there are green and pink bars, the width of which show the proportion of attributive and predicative uses respectively. The content-biased domains are marked with a darker shade. The vertical length of the bars shows the proportion of meanings within each of the domains. The pattern is remarkably distinct: In the schematically biased domains the adjective is predominantly used in the attributive construction, while the position for adjectives in the content domains is predominantly predicative, especially in the lower grades — although with a prominent development to more and more attributive uses. Adjectives within the SPATIAL domain (e.g., *central*, *deep*, *open*) show a somewhat greater variability regarding position, but attributive uses are still significantly dominant (p = 0.000) in all grades. Meanings to do with MATCH (e.g., *same*, *similar*, *different*) and QUANTITY (e.g., *numerous*, *many*, *few*) are hardly ever used predicatively, not even in Grade 3 where almost 70% of all constructions are predicative.

With regard to the content-biased domains, adjectives expressing meanings to do with EMOTION are predominantly used in predicative position in all grades. Notwithstanding the dominance of predicative uses for meanings in this domain, there is still a developmental trend towards increased attributive uses (the difference between Grade 3 and Grade 5, p = 0.000; there is no significant difference between Grades 5 and 9, but a significant difference of p = 0.014, again, between Grades 9 and 11/12). Interestingly, in Grade 3 more than half of the occurrences (56%) of adjectives expressing meanings to do with MERIT stand in attributive position. In Grades 5 and 9 the proportions are 59% and 51% respectively, that is, there is no clear developmental trend, but in Grade 11/12 the attributive uses constituted 70%. The difference between Grades 9 and 11/12 is significant (p = 0.000). The attributive uses of meanings to do with DEMEANOUR & DISPOSITION range from 21% to 56%, the trend being towards more attributive uses (except in Grade 5), the differences from one grade to the next, however, were not significant.
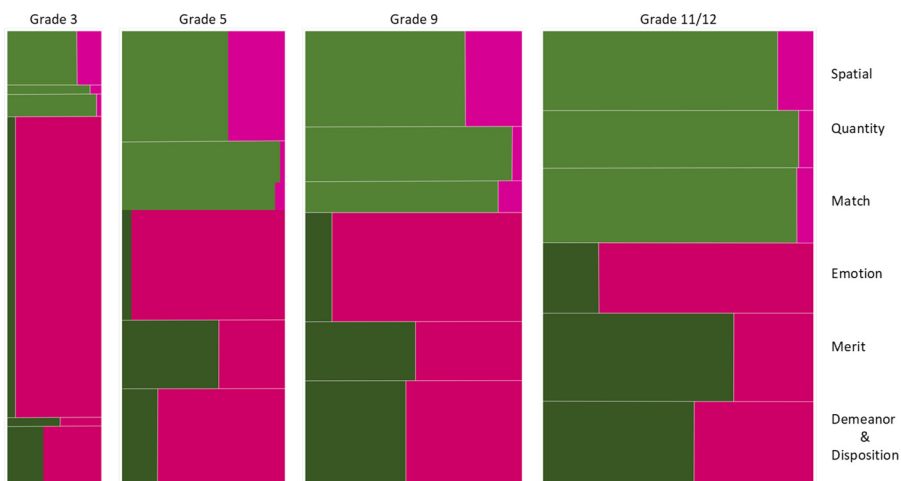
Figure 12.5
Distributions of predicative and attributive adjective uses in Grades 3, 5, 9, and 11/12

While the results illustrated in Figure 12.5 show that meanings from different domains seem to have a propensity to occur in either attributive or predicative position, it is also clear that meanings from all domains are used in both positions, not seldom expressing highly similar meanings. Two examples from the SPATIAL domain in Grade 3 are *when an elephant is friendly it has protruding ears* and *when the horse gets angry the mouth is open*. Both examples describe the non-time-stable 'posture' of an animal when feeling a certain emotion, with the adjective in the attributive position in the first example and in predicative position in the second example. Similarly, *a big square room* and *the roof would be triangular* (both Grade 5) describe the time-stable shape of a part of a building, one example attributively and the other predicatively. QUANTITY is rarely modified predicatively and occurrences such as *I have several treasures* (Grade 5) and *there are many myths about darkness* were dominant. There were, however, predicative uses as well, and in examples such as *the probability is non-existent* (Grade 9) and *the questions are many* (Grade 11/12) the predicative position highlights the information and makes it seem more newsworthy. Adjective meanings from the domain of MATCH are almost entirely used attributively and the most common meaning was *different*. Typical examples are *I have seen 65 different birds* (Grade 5) and *a billion different thoughts* (Grade 9) where *different* signifies separate instances of the same type of thing (species of *birds* in the example from Grade 5 and *thoughts* in the example from Grade 9). When *different* is used predicatively, as in *human beings and animals are quite different* (Grade 3) and *all people are different* (Grade 11/12) the meaning does not indicate different

instances, but dissimilar characteristics of the instances. It is not possible to change the adjective position without creating that shift in meaning.

In the content-biased domains predicative uses were dominant and adjective meanings to do with EMOTION, especially, were rarely in attributive position. Sentences of the type I/we/she/he/one is *afraid/sad/happy/angry* were the most common ones, with the exception of the expository texts in Grade 3 where the topic elicited emotion adjectives modifying meanings to do with animals. Attributive uses were uncommon but included examples such as *I'm in a good mood* (Grade 5), *to see all those exciting things* (Grade 9), and a*n admiring smile* (Grade 11/12). The domain of MERIT was the only domain where attributive and predicative uses are almost equally distributed in all grades (albeit with an increase of attributive uses in Grade 11/12). Typical examples of attributive uses were *what a good idea* (Grade 3), *the best decision* (Grade 9), and *the negative sides* (Grade 11/12) and *I think he is best* (Grade 5) and *the idea sounded good* (Grade 9) were examples of predicative uses. As the results in Figure 12.5 show, adjectives expressing DEMEANOUR & DISPOSITION were predominantly used predicatively in the two lower grades (e.g., *he looked dangerous* (Grade 3) and *my father is very kind* (Grade 5)). In Grades 9 and 11/12 attributive uses had increased to just under and just over 50% respectively (e.g., *those small bad thoughts* (Grade 9) and *I mean naïve persons* (Grade 11/12).

12.2.2 Summary and discussion of adjective construction

Adjectives can occur in either attributive or predicative position. The two different constructions constitute two distinctively different form-meaning types (Goldberg, 2006), playing an important role in the meaning creation of the adjective-noun combination. The results show a solid developmental trend going from roughly 30% attributive uses in Grade 3 to roughly 70% of attributive uses in Grade 11/12. The position of the adjective is closely linked to adjective function, and a closer look at the data revealed that the increase of attributive uses in the higher grades is mainly to do with the increase of using adjectives for kind identification/classification. In the describing function (specification), where the construction can be chosen freely, the proportion of attributive uses comprised between 14% and 18% in all grades. The choice of adjective position in specification may be influenced by aspects such as time-stability (Bolinger, 1967; Hopper & Thompson, 1984) and saliency (Frännhag, 2010).

The analysis of adjectives in different positions when expressing meanings from different domains revealed interesting patterns. The position of the adjective meanings from six prevailing domains, of which three were schematically biased domains and three content biased domains, were analysed. Meanings from the schematically biased

domains were used predominantly in attributive position, even in the lower grades. The position of the adjectives from the three content-biased domains showed greater variation. Overall, predicative uses were dominant, although with a distinct trend to more attributive uses in the higher grades. Meanings to do with emotions were, however, almost exclusively used in predicative position in the lower grades and despite there being a trend towards more attributive uses, predicative uses still constituted 80% in this domain in Grade 11/12. One could speculate that a reason for the dominance of predicative uses is the transiency of emotional states, i.e., that the aspect of time instability (at least in the domain of EMOTION) affects the choice of position (Bolinger, 1967; Nelson, 1976; Saylor, 2000). This would be in line with Nelson's (1976) study which showed that adults, as well as children (as young as 2.5 years) used adjectives predicatively mainly to comment on object and animate states, while descriptive and evaluative properties were used attributively for classification, identification, and specification of time-stable properties.

12.3 Degree and boundedness

Degree and boundedness are part of the schematic configuration of adjectives. All adjective meanings were analysed with regard to their construal being scalar, non-scalar, or non-gradable. Figure 12.6 shows the proportions of their respective uses in the different grades and genres. Scalar uses are by far the most common in all grades. This dominance of scalar uses of adjectives was expected, considering that a scalar configuration is typically associated with adjectives. In Grade 3 scalar uses counted for 87%, in Grade 5 for 65%, and in Grades 9 and 11/12 for 59% and 58% respectively. The difference between Grades 3 and 5 was significant ($p = 0.000$), the difference between Grades 5 and 9 was just barely significant ($p = 0.042$), while there was hardly any difference at all between Grades 9 and 11/12 ($p = 0.000$).

In Grade 3 non-scalar uses make up 12%, by Grade 5 the construal has become twice as common, standing for 24% ($p = 0.000$) and stays roughly the same in Grade 9 with 23%. By Grade 11/12 the non-scalar uses have decreased to 16%, which makes a significant difference ($p = 0.001$).

There are only 6 non-gradable uses in Grade 3, which makes less than 1%. A significant ($p = 0.000$) developmental leap has happened by Grade 5, where 11% of the construals were non-gradable. Non-gradable uses continued to increase and constituted 18% of all adjective uses in Grade 9 and 26% by Grade 11/12, the differences between every grade and the next being significant ($p = 0.000$ between all grades). In Grade 11 the number of non-gradable uses surpassed the number of non-scalar uses.

When adjectives are used in a classifying function, they are by default non-gradable. A closer look at adjective functions and gradeability reveals that the non-gradable configuration occurs in all functions. While extremely rare in identity provision and stipulation, they occur more often in specification and element identification.
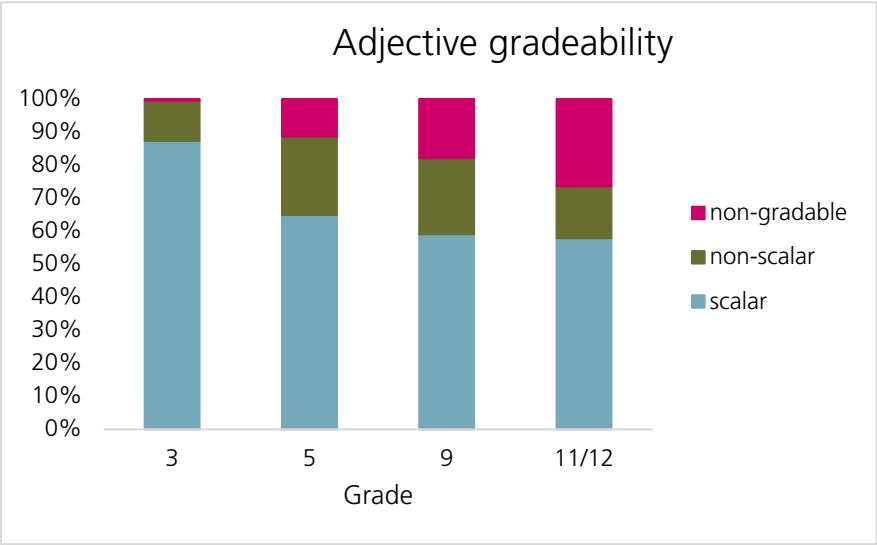
Figure 12.6
Average distribution of scalar, non-scalar, and non-gradeable adjective uses in Grades 3, 5, 9, and 11/12

Table 12.3 provides examples of scalar, non-scalar, and non-gradable adjective uses. Scalar uses were predominantly descriptive, often with meanings to do with emotions, as in *angry horse* and *insecure elephant* (Grade 3), age and size, as for example *small goblin* (Grade 3) and *old furniture* (Grade 5), and evaluation, as in *evil thoughts* (Grade 9) and *positive influence* (Grade 11/12). The non-scalar uses which are defined by something being either/or included meanings such as *adult horse* (Grade 3), *secret paths* (Grade 5), *unanswered questions* (Grade 9), and *broken relationships* (Grade 11/12). The non-gradable adjective configuration was predominantly used in the kind-identifying function including meanings such as *hot chocolate* (Grade 3), *big sister* (Grade 5), *long sleeved T-shirt* (Grade 9), and *classic comic books* and *moral role models* in Grade 11/12. Further non-gradable examples from other (non-classifying) functions are *extra effort* (Grade 11/12, description) and *last summer* (Grade 5, element identification).

Table 12.3

Examples of scalar, non-scalar, and non-gradable adjective uses in Grades 3, 5, 9, and 11/12

	Grade 3	Grade 5	Grade 9	Grade 11/12
Scalar	*arg häst* angry horse	*underbar katt* wonderful cat	*onda tankar* evil thoughts	*positiv inverkan* positive influence
	osäker elefant insecure elephant	*gamla möbler* old furniture	*tråkig person boring person*	*romantisk skildring* romantic depiction
	litet troll small goblin	*snäll mormor* kind grandmother	*läskiga filmer* scary movies	*överdrivna problem* exaggerated problems
Non-scalar	*vänster sida* left side *annan elefant* different elephant *vuxen häst* adult horse	*hemliga vägar* secret paths *oförberett prov* unprepared test *mållös (jag)* speechless (I)	*ingenting omöljligt* nothing impossible *nya medlemmar new members* *obesvarade frågor* unanswered question	*trasiga relationer* broken relationships *felfritt skolsystem* flawless school system *den utstötta tjejen* the ostracized girl
Non-gradeable	*varm choklad* hot chocolate *sådana gubbar* such geezers *andra varvet* second lap	*stora syrra* big sister *förra sommaren* last summer *radiostyrd båt* radio-controlled boat	*enstaka person* stray person *långärmad t-shirt* long-sleeved t-shirt *dataspelande ungdomar* computer gaming adolescents	*klassiska serietidningen* classic comic book *moraliska förebilder* moral role models *den utstötta tjejen* the ostracized girl

Note. Adjectives are shown in combination with the noun they modify. It is in context, in the interaction with the noun that the adjective meaning and configuration is determined.

12.3.1 Summary and discussion of the results for degree and boundedness

Degree and boundedness are part of the schematic configuration of adjectives. Neither boundedness nor degree are properties of word classes or individual words (Paradis, 2001), but are ways in which we construe meanings. Adjective meanings tend to have a 'default' configuration, i.e., the basic meaning expressed by the adjective makes it biased to be configured in a certain way, i.e., as scalar, non-scalar, or non-gradable, as in *very good book* (scalar), *completely closed door* (non-scalar), and *political decision* (non-gradable). But just like the content part of the adjective, the configuration, too, is subject to construal, and the configuration that seemed to be the most natural in basic, descriptive usage is easily modulated and changed by context and furthermore defined by function.

The results of this study show that scalar adjective uses were, as was to be expected, dominant in all grades. In Grade 3 they made up 87%, followed by non-scalar uses, whereas non-gradable uses are almost non-existent. The development of the use of the non-scalar configuration showed a major increase from Grade 3 to 5, hardly any difference at all between Grades 5 and 9 and a significant decrease to the benefit of

non-gradable uses in Grade 11/12. Considering non-gradable uses there is a developmental leap between Grades 3 and 5 where they become more common. In all grades, the differences from one grade to another were significant and the difference from almost no instances at all in Grade 3 to 26% of all adjectives in Grade 11/12 is remarkable. While most of the non-gradable instances were used in a classifying function, non-gradable uses did occur in all different functions, most commonly (but still not often) when describing (specification) or identifying (element identification) a nominal meaning.

There are studies (e.g., Syrett & Lidz, 2010; cf. section 8.2.6) that show that children as young as 30 months already possess a sensibility with regard to configurations of degree and make use of degree modifiers. However, Tribushinina (2017) shows in a subsequent study that children that young are only able make use of degree modifiers if there are no semantic, morphological, or phonological ambiguities involved. The error patterns in another study by Tribushinina (2012) suggest that gradeability is still in development when children begin primary school at the age of six (cf. section 8.2.6). The results of Tribushinina's studies indicate that a full understanding of the construal of degree happens over a long time. The results of the current study show that there is a continued development over the school years, with a major development happening as late as between Grades 9 and 11/12.

12.4 Adjective functions

Approximately 1000 adjective and noun combinations from each age group were annotated with regard to function. Figure 12.7 shows the distribution of the adjective functions across the different grades. In Grades 3, 5, and 9 specification (description) was by far the most common adjective function, constituting around 80%, with no significant differences between the grades until Grade 11/12, where the number had dropped to 47%, primarily to the benefit of kind identification (the difference from Grade 9 was p = 0.000).

Element identification, that is, the function that restricts the number of potentially intended referents, was applied in all grades (Grade 3 (16%), 5 (4%), 9 (16%), and 11/12 (12%). In Grades 3 and 9 it was the second most common function after specification. Grade 3 had significantly more element-identifying uses than Grade 5, and Grade 9 had significantly more than Grade 5. Grade 11/12 had fewer uses again, although the difference to Grade 9 was not significant.

Identity provision, that is, using the adjective to create a category within the particular discourse, is a function that is unusual in all grades (under 5% in all groups, the only significant difference was between Grades 9 and 11/12, p = 0.002).

Stipulation is the function where some condition is specified that the referent needs to fulfil. This function did not occur at all in Grade 3 and was used under 4% in Grades 5 and 9 (with no significant difference). In Grade 11/12, the function is somewhat more common and has increased to almost 6% (difference between p = 0.000).

The function of kind identification (classification) is the only function that shows a developmental trend, from almost no occurrences at all in Grade 3 (two occurrences, less than 1%) to 32% of all occurrences in Grade 11/12. In Grades 5 and 9 kind identification is still unusual (7% and 4% respectively); thus there is a developmental leap between Grades 9 and 11/12 (p = 0.000).
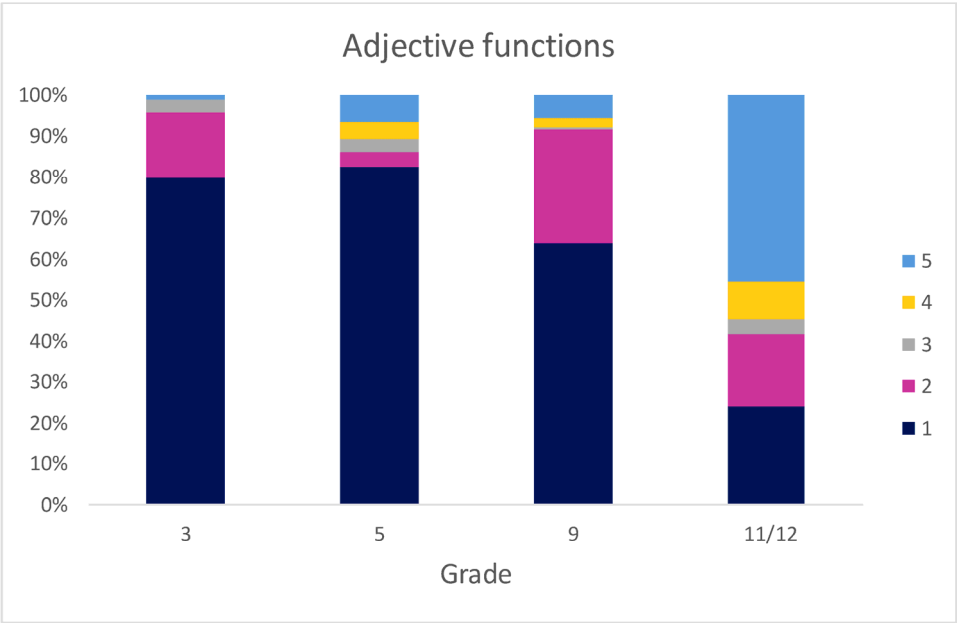
Figure 12.7
Average distribution of adjective functions in Grades 3, 5, 9, and 11/12. 1 = Specification 2 = Element identification 3 = Identity provision 4 = Stipulation 5 = Kind identification

Table 12.4 shows examples of adjectives used in the specifying function. As can be seen, in some of the sentences the adjective stands in attributive position and in others in predicative position. The examples chosen also illustrate the development from writing about concrete things close to home, such as *big, fat spider* (Grade 3) and *match rules*

that are simple (Grade 5), to more abstract and general statements, such as *atrocities in peaceful cities* (Grade 9) and *nasty and humiliating remarks* (Grade 11/12).

Table 12.4
Examples of adjectives used for specification from texts in Grade 3, 5, 9, and 11/12

Grade	Examples							
3	*Där*	*stod*	*en*	*stor*	*fet*	*spindel.*		
	There	stood	a	big	fat	spider		
	There was a big fat spider.							
	När	*en*	*elefant*	*är*	*osäker*	*så*	*stoppar den*	*snabeln* *i munnen.*
	When	an	elephant	is	insecure	then	stuffs it	trunk the in mouth the
	When an elephant is insecure it puts its trunk in the mouth.							
5	*Jag*	*har*	*ett*		*speciellt*	*mynt.*		
	I	have	a		special	coin		
	I have a special coin.							
	Matchreglerna		*är*	*enkla.*				
	Match rules the		are	simple				
	The match rules are simple.							
9	*Hemska*	*bilder*	*bränns*	*fast*		*på*	*näthinnan.*	
	Horrible	pictures	are burned	permanently		onto	retina the	
	Horrible pictures are permanently burned onto the retina.							
	Illdåd		*i*	*städer*	*som*	*vanligtvis*	*är*	*fridfulla.*
	Artrocities		in	cities	that	usually	are	peaceful
	Atrocities in usually peaceful cities.							
11/ 12	*Taskiga*	*och*	*förnedrande*	*påpekanden.*				
	Nasty	and	humiliating	remarks.				
	Nasty and humiliating remarks.							
	Antingen	*är*	*karaktärerna*	*superglada*	*jättearga*	*eller*	*grymt*	*besvikna.*
	Either	are	characters the	super happy	very angry	or	horribly	disappointed
	The characters are either super happy, very angry, or horribly disappointed.							

Table 12.5 shows examples of adjectives in the element identifying function. Element identifying adjectives always take the attributive position. In Grade 3, due to the topic they were writing about, many of the uses were to do with identifying animals in a certain emotional state, such as *an angry elephant has its trunk pointing upwards*. Examples from Grade 5 are more varied but were often still to do with things experienced first-hand, as in *behind my old house*. In Grades 9 and 11/12 the elements identified are often more generic, as in *the injured person* (Grade 9) and *the patient reader* (Grade 11/12).

Table 12.5

Examples of adjectives used for element identification from texts in Grade 3, 5, 9, and 11/12

Grade			Examples					
3	*En*	*glad*	*häst*	*visar*	*sina*	*tänder.*		
	A	happy	horse	shows	its	teeth		
	A happy horse shows its teeth.							
	De	*såg*	*en*	*av*	*de*	*stora*	*båtarna*	*komma.*
	They	saw	one	of	the	big	boats	coming
	They saw one of the big boats coming.							
5	*I*	*skogen*	*bakom*	*mitt*	*gamla*	*hus.*		
	In	forest the	behind	my	old	house		
	In the forest behind my old house.							
	Det	*är*	*roligt*	*att*	*träffa*	*nya*	*vänner.*	
	It	is	fun	to	meet	new	friends	
	It is fun to meet new friends.							
9	*Den*	*skadade*	*personen.*					
	The	injured	person					
	The injured person.							
	Hemska	*saker*	*inträffar*	*sällan*	*på*	*dagen.*		
	Horrible	things	happen	rarely	on	day the		
	Horrible things rarely happen during the day.							
11/ 12	*Den*	*tålmodige*	*läsaren.*					
	The	patient	reader					
	The patient reader.							
	En	*ökad*	*tolerans*	*för*	*tidigare*	*tabubelagda*	*fenomen.*	
	An	increased	tolerance	for	previously	taboo	phenomena	
	An increased tolerance for previously taboo phenomena.							

Table 12.6 provides examples of adjectives used in order to provide identity. In the first example from Grade 3, the writer creates the category of *living babies* for this particular discourse (*living* here not being used as an antonym to *dead*, but as opposed to spawn). *Sick rats* is an example of a category created by a fifth grader. *Small children* and *insecure teenager* are examples of identity provision from Grades 9 and 11/12 respectively. The examples show that, while the function of identity provision is rare in all age groups, this is not due to student's incapability; even in the two lower grades students created discourse-specific categories when that was what their communicative intention required.

Table 12.6

Examples of adjectives used for identity provision from texts in Grade 3, 5, 9, and 11/12

Grade	Examples

Grade	Examples
3	*Elefanter* *föder* *levande* *ungar.* Elephant give birth living babies Elephants give birth to living babies.
	Vi *har* *bestämt* *att* *vi* *ska* *testa* *något* *nytt.* We have decided that we will try something new We have decided to try something new.
5	*Då* *fick* *han* *komma* *till* *ett* *ställe* *med* *sjuka* *råttor.* Then got he come to a place with sick rats Then he got to go to a place with sick rats.
	Man *lär* *sig* *måla* *riktiga* *tavlor.* One learns oneself paint real paintings One learns to paint real paintings.
9	*Små* *barn* *är* *också* *rädda* *för* *monster* *under* *sängen.* Small children are also afraid of monsters under bed the Small children are also afraid of monsters under the bed.
	Man *får* *mindre* *tid* *för* *läxor* *och* *ett* *socialt* *liv.* One gets less time for homework and a social life One gets less time for homework and a social life.
11/ 12	*Perioden* *i* *mitt* *liv* *då* *jag* *själv* *var* *en osäker* *tonåring.* Period-th in my life when I myself was an insecure teenager The period in my life when I myself was an insecure teenager.
	Många *av dem* *uppfyllde* *inte* *idealbilden* *av en* *god människa* Many of them did meet not ideal image the of a good person Many of them did not meet the ideal image of a good person.

Table 12.7 provides examples of adjectives used for stipulation. The function of stipulation is used to specify a condition that something needs to fulfil in order to be viable. When the fifth grader was choosing a Christmas tree, it had to be a *really big* one. The ninth grader demanded *colourful lamps* for her room, and a student in Grade 11/12 needed a *stronger word* to express the outrage he was feeling. Stipulation was the only function that did not have a single occurrence in Grade 3. Considering that even relatively small children are able to express specific wishes they want to be met, if the amount of data had been more extensive, examples would presumably have been found in this age group as well.

Table 12.7

Examples of adjectives used for stipulation in Grades 5, 9, and 11/12

Grade	Example					
5	*Vi*	*ville*	*ha*	*en*	*jättestor*	*gran.*
	We	wanted	have	a	really big	fir tree
	We wanted a really big fir tree.					
	Vi	*söker*		*efter*	*ett*	*blått*	*hus.*
	We	are searching		after	a	blue	house
	We are searching for a blue house.					
9	*Ge*	*mig*	*färgglada*	*lampor.*		
	Give	me	colourful	lamps		
	Give me coulourful lamps.					
	Vi	*behövde*	*en*	*stark*	*pinne.*	
	We	needed	a	strong	stick	
	We needed a strong stick.					
11/ 12	*Vi*	*behöver*	*ett*	*starkare*	*ord.*	
	We	need	a	stronger	word	
	We need a stronger word.					
	Gjord	*under*	*bra*	*förhållanden.*		
	Made	under	good	conditions		
	Made under good conditions.					

Table 12.8 shows examples of kind identification. Kind identification was the only function that showed a clear developmental trend with a considerable increase of usage between Grades 9 and 11/12. There were only two occurrences in Grade 3, one referring to *hot chocolate* and the other to a kind of salami which in Sweden is called *dotted sausage*. Only, in this case, it is not the kind sausage that is referred to, but a marble with a pattern reminding of it. *Classical instrument* is an example from Grade 5, and *political reasons* and *global warming* are examples from Grades 9 and 11/12 respectively. Again, these examples mirror the development towards greater genericity and abstraction in the older age groups, while the adjective performs the same function.

Table 12.8
Examples of adjectives used for kind identification from texts in Grade 3, 5, 9, and 11/12

Grade	Examples
3	*Det var Samuels pappa som kom med varm choklad.* It was Samuel's dad who came with hot chocolate It was Samuel's dad who brought us hot chocolate. *Maria körde med en prickig korv.* Maria drove with a spotted sausage Maria chose a salami.
5	*Cello är ett instrument som många tror bara passar till klassisk musik.* Cello is an instrument which many belive only fits classical music Cello is a beautiful intrument which many believe only to be suited for classical music. *Jag kollade på film på min bärbara DVD-spelare.* I watched on film on my portable DVD-player I watched a film on my portable DVD-player.
9	*Dennis var hotad av politiska skäl.* Dennis was threatened for political reasons Dennis was threatened for political reasons. *Reglerade flextider gynnar båda parter.* Regulated flexitimes benefits both parties Regulated flexitimes benefits both parties.
11/ 12	*Utan konstgödel och kemiska bekämpningsmedel.* Without artificial fertilisers and chemical pesticides Without artificial fertilisers and chemical pesticides. *Inte förrän nu hade jag tänkt på global uppvärmning.* Not until now had I thought about global warming Not until now had I considered global warming.

12.4.1 Summary and discussion of the results for adjective functions

Frännhag (2010) identifies five adjective functions. Specification, i.e., the describing function, is the one most readily associated with adjectives. The role of specifiers is to describe some property of a referent, adding information and thereby providing the interpreter with a more detailed picture of the referent: 'Her new dress was yellow with red polka dots.' Specification was the dominant adjective function in all grades. In Grades 3 and 5 adjectives were used as descriptions in approximately 80% of all instances. In Grade 9 descriptions stand for 64% of the uses, but in Grade 11/12 the number has dropped to 47% mostly in favour to kind identification, i.e., classification. Secondly, there is the function of element identification. Identifiers restrict the number

of potentially intended entities, as in 'Do you mean the blue or the red dress?' Element identification was the second most common adjective function in Grades 3 and 9. Thirdly, when the intended element belongs to a structural space and is not known to the interpreter, the adjective and noun serve to provide identity. Because they automatically decide the scope of the relevant element, identifiers have a restrictive function ─ they point out precisely what is talked about: 'Trees that have green leaves or needles all year are called evergreens'. Identity provision occurs in all grades but is very uncommon in all of them (under 5%). The fourth function, stipulation, is to specify a condition something has to meet in order to qualify as the intended referent. The intended referent is not a specific one, but it has to possess a specific attribute, e.g., to be a certain size or colour in order to qualify as a referent, as in 'We need a *big* tent'. Stipulation is another function that was rare in all grades and the function was not used at all in Grade 3. Finally, the last function is kind identification, traditionally called classification. An adjective performing this function identifies a sub-kind of a thing or concept, like *political debate*, or *low-energy light bulb*. Kind identification only occurred twice in Grade 3 and remained unusual in Grade 5 (7%) and Grade 9 (4%). In Grade 11/12, however, kind identification constitutes the second most common function after specification (32%).

The results show that all functions (except for stipulation, which I believe is due to the relatively limited amount of data) were represented in all grades. It seems that students in all grades have the competency to apply all of the functions, even the more uncommon ones, if they need to, in order to reach their communicational goal. There is no consistent developmental trend, except for kind specification which remains exceedingly rare even in Grade 9 but is the second most common function in Grade 11/12.

12.5 The example environmentally friendly

The topic 'Consumer power' in Grade 11/12 elicited a great number of meanings to do with environmentally friendly products. The expression *environmentally friendly* (*miljövänlig*) was used in many different functions, to modify all kinds of nominal meanings, using different adjective ontologies (gradeability) in both attributive and predicative position. The example of *environmentally friendly* thus serves well to exemplify how the same lexical items can be used to express different meanings and functional purposes.

1. Kravmärket visar att produkten är etisk och *miljövänlig.*
   The eco-label shows that the product is ethically and *environmentally friendly*.

2. Att köpa *miljövänliga* glödlampor till sitt hus är ett enkelt och effektivt sätt att påverka.
   To buy *environmentally friendly* lightbulbs for one's house is a simple and effective way to make a difference.

3. För dig som kör bil kan du på det stadiet bli mer *miljövänlig*.
   If you are driving it is possible to get more *environmentally friendly* in this stage, too.

4. Märket innebär att produktionen av varan har skett på ett *miljövänligt* och etiskt vis.
   The label signifies that the production of the article has happened in an *environmentally friendly* way.

5. Är det konsumenterna som inte efterfrågar *miljövänliga* alternativ tillräckligt mycket?
   Are the consumers not requesting *environmentally friendly* alternatives enough?

6. De *miljövänliga* varorna är dyra.
   The *environmentally friendly* products are expensive.

7. Det är coolt med en *miljövänlig* bil.
   It is cool to have an *environmentally friendly* car.

In 1. *environmentally friendly* is used predicatively to specify a 1st order entity (*eco-label*). The meaning is non-scalar, since a product either is or is not labelled as environmentally friendly.

In 2. *environmentally friendly* is used for kind identification, more specifically, to identify a certain kind of lightbulb (1st order meaning). In this function the adjective always stands in attributive position and is always non-gradable.

In 3. *environmentally friendly* is again (as in 1.) used predicatively for the specification of a 1st order meaning. However, this time it is used as a scalar modifier, encouraging the reader to become more environmentally friendly.

In 4. *environmentally friendly* is used predicatively to specify the 2nd order meaning *production*. The meaning is non-scalar, since the production either is, or is not environmentally friendly.

In 5. *environmentally friendly* kind-identifies a 3rd order meaning, namely, *alternatives*. This makes the adjective non-gradable by default and the attributive position obligatory.

In 6. *environmentally friendly* is element-identifying, that is restricting the number of potentially intended elements to be environmentally friendly. In *environmentally friendly products* the adjective is non-scalar and in attributive position.

In 7. *environmentally friendly* stands in attributive position and provides identity, i.e., the category of *environmentally friendly* is created for this specific discourse. The adjective configuration is non-gradable.

13 Figurative meaning

All adjective–noun combinations were annotated with regard to figurativeness at the level of three different construals. Non-figurative readings were annotated as basic, figurative cross-domain mappings as metaphor, and part-whole/whole-part relationships as metonyms. The results are presented in this chapter. Since no consistent genre or gender differences were found, these are not presented.

13.1 Basic, metaphorical, and metonymical uses

The mosaic plot (Figure 13.1) provides a visual representation of how the use of figurative language develops over the school years. The width of the column for each grade is proportional to the number of observations, that is, the number of adjective-noun combinations analysed from that group. Within the column of each grade, there are multicoloured bars, the width of which show the proportion of 1st (green), 2nd (pink), 3rd (blue) order noun ontologies, as well as meanings to do with TIME (yellow). The vertical length of the bars shows the proportion of (from top to bottom) basic, metaphoric, and metonymic adjective-noun combinations. It is in the lower part of the plot that the development of figurative language is visible. As can be seen, metonyms remain extremely rare even in the higher grades and the differences from one grade to the next are not significant (not even the difference between the lowest and the highest grade is significant). While the proportion of metaphors also continues to be small, there is a gradual increase of construing 1st, 2nd, and 3rd order nouns as metaphors, with a significant increase from one grade to the next (the difference between Grades 3 and 5, $p = 0.005$, the other differences all $p = 0.000$). I want to remind the reader that reifications are annotated as metaphors — that is, abstract meanings construed as something measurable in space and time, are annotated as metaphors. These include meanings to with TIME, which are shown as a separate category in the yellow bar.
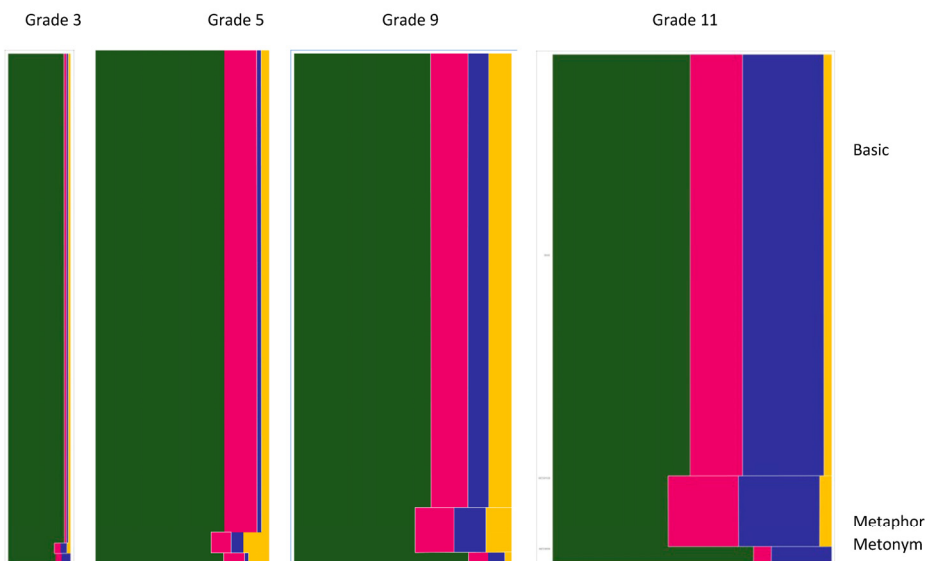
Figure 13.1
Distributions of basic, metaphoric, and metonymic adjective uses across 1st (green), 2nd, (pink), 3rd (Blue), and 4th (yellow) order meanings in Grades 3, 5, 9, and 11/12

13.1.1 Metaphorical uses in Grade 3

In Grade 3 only 18 (2%) of 1042 adjective-noun combinations were metaphorical in some way. Ten of them were 1st order meanings, of which 7 were an extension of the meaning of THING. The two 1st order examples in Table 13.1 illustrate that, while it is rare, children in Grade 3 can use other metaphors as well. The expression *our closest cousins* about chimpanzees is a conventional metaphor to describe genetic similarity. *Get a solid glove to chew on* is interesting because it would be my assumption that this is a creative variation of the Swedish conventionalized metaphor *to give someone a boot* (*ge någon en känga*), i.e., to reprimand someone (with an element of Schadenfreude). There were four 2nd order meanings construed as metaphors, all of them conventionalized ways of expressing certain meanings. The two examples in Table 13.1, *a dark voice* and *small cry of fear*, both describe sound, more specifically, sounds made by human beings. *Dark* in *dark voice* is used to describe a voice low in pitch, and *small* in *small cry* as a cry that is short in duration and possibly not very loud. Two 3rd order meanings were metaphorical; one of them is a common reification where *big* is used to describe a high degree in *big risk*, and in the second one *imagination* is construed as a lively person in *lively imagination*, which is idiomatic in Swedish.

Table 13.1

Examples of different types of metaphor from texts in Grade 3

Noun ont.				Examples					
1st	*Och*	*schimpanser*	*är*	*våra*	*närmaste*	*kusiner.*			
	And	chimpanzees	are	our	closest	cousins			
	And chimpanzees are our closest cousins.								
	Han	*ska*	*få*	*sig*	*en*	*rejäl*	*handske*	*att*	*tugga på.*
	He	will	get	himself	a	solid	glove	to	chew on
	He will get a solid glove to chew on.								
2nd	*Jag*	*har*	*väntat*	*på*	*dig*	*sa*	*en*	*mörk*	*röst.*
	I	have	waited	for	you	said	a	dark	voice
	I have been waiting for you a dark voice said.								
	Jag	*gav*	*ifrån*	*mig*	*ett*	*litet*	*rop*	*av*	*rädsla.*
	I	let	out	me	a	small	cry	of	fear
	I let out a small cry of fear.								
3rd	*Då*	*är*	*risken*	*stor*	*att*	*man*	*blir*	*biten.*	
	Then	is	risk the	big	that	one	will	bitten	
	Then there is a big risk that one will get bitten.								
	Då	*sa*	*mamman*	*att*	*hon*	*hade*	*livlig*	*fantasi.*	
	Then	said	mother the	that	she	had	lively	imagination	
	Then the mother said that she had a lively imagination.								

13.1.2 Metaphorical uses in Grade 5

In the Grade 5 data, 111 (4%) out of 2775 adjective-noun combinations had some metaphorical element. The vast majority (73) were metaphorical 1st order meanings. Again, there are numerous uses of *things* in a transferred sense. Certain kinds of objects can be described as tired, or even dead: The clock being *tired,* is a comment on Salvador Dalí's melting clock in the painting 'The Persistence of Memory' (1931). Calling a mobile phone dead is a well-understood way of saying the phone has run out of battery. There were also examples of conventionalized metaphors in this age group indicating a growing maturity and insight into life and relationships, as the two examples in Table 13.2, where *went separate ways* metaphorically describes how different circumstances and choices made two people cease to be in communication and *be open* is a metaphorical description of being receptive to new ideas. Second order metaphorical meanings were dominated by reifications of meanings to do with sports or other activities, mostly, but not only, in combination with adjectives such as *big*, *small*, and *little*. In *hard sessions*, *hard* expresses a high level of intensity, and in *entangled situations*, *entangled* is used metaphorically to describe a situation as complex. Reifications in which adjectives modify meanings with regard to size, were common for 3rd order

abstract meanings. Reifications to with TIME were of the type *long day*, or as one of the examples in Table 13.2, *long discussion*, where *long* is used to describe an extended period of time. IMPORTANCE is also often indicated metaphorically with size adjectives, as in *football can play a big role in your life* (Table 13.2).

Table 13.2
Examples of different types of metaphor from texts in Grade 5

Noun ont.	Examples								
1st	*Vi*	*bodde*	*grannar*	*men*	*gick*	*skilda*	*vägar*	*när*	*jag flyttade.*
	We	lived	neighbours	but	went	I	roads	when	I moved
	We were neighbours before but went sperate ways when I moved.								
	Man	*lär*	*sig*	*jobba*	*I*	*grupp*	*och*	*vara*	*öppen.*
	One	learns	oneself	work	in	group	and	be	open
	You learn to work in a group and be open.								
2nd	*Vi*	*kör*	*rätt*	*hårda*	*träningar.*				
	Vi	drive	quite	hard	sessions				
	We practice quite hard.								
	Efter	*en*	*annan*	*lång*	*diskussion*	*vet*	*vi*	*exakt*	*hur vi ska göra.*
	After	an	other	long	discussion	know	we	exactly	how we will do
	After another long discussion we know exactly what to do.								
3rd									
	Fotboll	*kan*	*spela*	*stor*	*roll*	*i*	*din*	*framtid.*	
	Football	can	play	big	role	in	your	future	
	Football can play a big role in your future.								

13.1.3 Metaphorical uses in Grade 9

In Grade 9, 331 (8%) out of 4001 adjective-noun combinations were metaphorical. The number of 2nd order (59) and 3rd order (49) reifications is considerably higher than in the lower grades. In addition to the kind of 1st order metaphors in 3rd and 5th grade, modifications of perceptual impressions, such as *strong smell* and *strong light* are common. Furthermore, expressions about people become more common and somewhat different, as in: *ett mindre bitskt gäng ungdomar* (*a less snappish group of teenagers*) and *De är mördare, inte efterblivna sågspån* (*They are murderers, not retarded sawdust*). As can be seen in Table 13.3, older, more experienced people are described as *enlightened*, and an emotionally unstable person is a metaphorical *wreck*. Instances of 2nd order metaphors proper were emotions described with a colour word, as in the example in Table 13.3 *The grey, dull feeling*. In *had an aggressive headache* (Table 13.3) a type of behaviour, i.e., aggression, is used metaphorically to describe a certain kind of

pain. Second order reifications were often to do with emotions, as in *my biggest fear*. Third order figurative expressions were dominated by modifications of degree (e.g., *higher demands* (see Table 13.3) mostly, but not only, with size terms; but there were other expressions as well, for example a science-related term like *volatile* applied to plans.

Table 13.3
Examples of different types of metaphor from texts in Grade 9

Noun ont.					Examples				
1st	*De*	*äldre*	*mer*	*upplysta*		*personerna.*			
	The	older	more	enlightened		persons			
	The older more enlightened persons.								
	Vem	*vill*	*bli*	*ett*	*ynkligt*	*lättretat*	*vrak.*		
	Who	wants	become	a	pitiful	short-tempered	wreck		
	Who wants to become a pitiful short-tempered wreck?								
2nd	*Hade*	*en*	*aggressiv*	*huvudvärk*	*förskräckligt.*				
	Had	an	aggressive	headache	horrible				
	Had an aggressive headache, horrible.								
	Den	*gråa*	*trista*	*känslan.*					
	The	grey	dull	feeling					
	The grey, dull feeling.								
3rd	*Vi*	*gjorde*	*upp*	*lättflyktiga*	*planer.*				
	We	made	up	volatile	plans				
	We made volatile plans.								
	De	*kan*	*ställa*	*höga*	*krav*	*och*	*ändå*	*få*	*sin vilja igenom.*
	They	can	put	high	demands	and	still	get	their will through
	They can make even high demands and still get what they want.								

13.1.4 Metaphorical uses in Grade 11/12

In Grade 11/12 679 (14%) of 4926 adjective-noun combinations were metaphorical, 284 of them 1st order meanings. Most of them were of the same kind or similar to the metaphorical meanings expressed by students in lower grades, but there were also some that I perceive to be closer to adult language use, such as *clear links* and *the right way*, as well as the 1st order examples shown in Table 13.4, i.e., *hit a sore point* and *tread on a sensitive area* where physical soreness and sensitivity are used metaphorically to describe psychological and emotional states. Also shown in Table 13.4 is the sentence *an open and accepting environment*, which contains both a metaphor and a metonym, i.e., *open* in an *open environment* metaphorically describes an environment that is tolerant and perceptive to new ideas, but the expression as such is also metonymic, since

it is not the environment itself that carries these attributes, but the people in it. Furthermore, there are a few 1st order metaphors in Grade 11/12 that can be read either as creative uses of some conventionalized metaphors, or alternatively as attempts to convey a meaning with a conventionalized metaphor, without having fully figured out how it is used, for example: …*and I have truly developed from being the little piece of coal to become a polished diamond* and *the backpack full of experiences*.

Examples of metaphorical 2nd order meanings include *criminality is very high* and *broken relationships*, where degree is expressed by means of HEIGHT in the first case and a dysfunctional or unhappy relationships as something broken, in the second. In the first example of 2nd order metaphor in Table 13.4, i.e., *strong film experiences*, an expression of force is used to express emotional intensity. The second example is a reification. In *school attendance was wasted*, the 2nd order notion of attendance is treated as an artefact or a resource that could be thrown away or go to waste.

Many of the 3rd order reifications were again modifications to do with degree, most of them with size terms and terms to do with force, with typical examples such as *big threat*, *strong opinions*, and *small factors*. Other 3rd order examples include: *infringement is a very broad topic*, with the meaning that the topic includes a lot of subject matter, *sharper comments*, meaning comments that are intelligent and to the point. In the examples in Table 13.4, *biggest* in *biggest impression* shows size again used to express degree, and music being described as *broken and honest* in the second example, conveys a 3rd order meaning in terms of human behaviour (honesty) and a defective artefact (broken).

Table 13.4

Examples of different types of metaphor from texts in Grade 11/12

Noun ont.	Example					
1st	*En*	*öppen*	*och*	*accepterande*	*miljö.*	
	An	open	and	accepting	environment	
	An open and accepting environment.					
	Någon	*lyckas*	*träffa*	*en*	*öm*	*punkt.*
	Someone	manages	hit	a	sore	point
	Someone manages to hit a sore point.					
2nd	*Axelsoon*	*har*	*forskat*	*kring*	*starka*	*filmupplevelser.*
	Axelsson	has	researched	abou	strong	film experiences
	Axelsson has done research on strong film experiences.					
	Jag	*skulle*	*ljuga*	*om jag*	*påstod att*	*skolgången var bortkastad.*
	I	would	lie	if I	claimed that	school attendance was wasted
	I would lie if I said attending scholl had been a waste.					
3rd	*Det som*	*jag*	*fick*	*det största*	*intrycket*	*av i filmen (…).*
	That which	I	got	the biggest	impression	of in the film (…)
	What made the biggest impression on me in the film (…).					
	Hans	*musik can*	*beskrivas*	*så ärlig*	*och trasig*	*musik kan bli.*
	His	music can	be described	as honest	and broken	as music can get
	His music can be described as honest and broken as music can get.					

13.2 Metonymical uses in the different grades

As mentioned above and visually represented in Figure 13.1, metonyms remain extremely rare over the school years. While there are metonymical occurrences already in Grade 3, there is no significant development and the differences between the Grades, even the difference between the highest and lowest grade, is not significant. Adjectives modifying facets such as *conscious companies* and *artistic school*, as well as zone activation such as *legal graffiti walls* and *beautiful instrument* occurred, but were rare, and were annotated as metonyms.

Table 13.5 shows examples of metonyms from the different grades. *Happy vacation* (Grade 3), *cosy colour* (Grade 5), *emotional glow*, and *safe friends* (Grade 9) are metonyms in which emotions are expressed. These emotions are experienced by people, but here they are metonymically attributed to something in the wider situational context, such as a *vacation* which the family enjoyed, or friends with whom the writer felt safe (rather than friends who were safe). Using *little* instead of young (i.e., using a person's tallness to indicate age) as in *There was a time when I was little* (Grade 3) is a

conventional metonym, and constituted half of the metonyms in Grade 3. *Schools* (in Grade 5), *neighbouring countries* (in Grade 9), and *the programme Idol* (in Grade 11/12) are all used metonymically to refer to the PEOPLE in those contexts. *Diagnoses* (Grade 11/12) is used metonymically to refer to illnesses.

Table 13.5
Examples of metonyms from the different grades.

Grade	Examples								
3	*De*	*fick*	*en*	*lycklig*	*semester.*				
	They	got	a	happy	vacation				
	They had a happy vacation.								
	Det	*var*	*en*	*gång*	*när*	*jag*	*var*	*liten.*	
	It	was	a	time	when	I	was	little	
	Once when I was little.								
5	*Inuti*	*skulle*	*det*	*vara*	*en*	*mysig*	*färg.*		
	Inside	would	it	be	a	cozy	colour		
	There would be a cozy colour inside.								
	Man	*åker*	*på*	*turné*	*för*	*att*	*möta*	*andra*	*skolor.*
	One	goes	on	tour	for	to	meet	other	schools
	One goes on tour to compete with other schools.								
9	*Jag*	*sade*	*upp*	*kontakten*	*med*	*alla*	*mina*	*trygga*	*vänner.*
	I	said	up	contact the	with	all	my	safe	friends
	I withdrew from all my safe friends.								
	Jag	*tittade*	*upp*	*i*	*gatulyktans*	*känslosamma*	*sken.*		
	I	looked	up	in	street light's	emotional	glow		
	I looked into the emotional glow of the street light.								
11/ 12	*Programmet*	*Idol*	*är*	*väl*	*medvetna*	*om*	*det.*		
	Program the	Idol	is	well	aware	of	it		
	The program Idol is well aware of it.								
	Diagnoser	*är*	*som*	*sagt*	*ärftliga.*				
	Diagnoses	are	as	said	hereditary				
	Diagnoses are as mentioned hereditary.								

13.3 Summary and discussion of the results for figurative meanings

Metonymical construal is extremely rare in this data and does not show any increase over the school years. In contrast, the use of metaphors, while rare in the lower grades, increases significantly over the school years.

Despite studies showing early metaphor comprehension (Pouscoulous & Tomasello 2019; Vosniadou, 1987), as well as early metaphor production (Dent & Rosenberg, 1990), metaphors are almost non-existent in Grade 3. While it is possible that the results mirror the use of metaphors of children that age, it seems more likely to me that the cognitive effort of the writing process (cf. section 8.7) does not leave room for more creative or cognitively demanding language use. There are also, however, several other conceivable reasons why metaphors were extremely rare in the younger grades ─ many metaphors that people use are conventionalized metaphorical expressions or based on conventionalized metaphorical expressions that young students might not yet have come across or internalized. Even if (as is the view taken in this thesis) metaphors are conceptualizations of embodied and situated experiences (Chemero, 2009; Gallagher, 2006; Gibbs, 2006, 2019; Jensen & Cuffari, 2014) and therefore part of the human experience from birth, verbally expressing such experiences may still require a certain level of cognitive maturity in combination with world knowledge. Understanding or uttering a meaning such as *boiling with anger*, evidently does not only require a person to have experienced anger, but also knowledge of what boiling means and the behaviour of, for example, boiling water.

The results of this study show an increase of metaphorical language use that is significant between each grade and the next, with the biggest developmental leap happening between Grades 5 and 9. It seems reasonable to expect both a significant cognitive development and also a substantial increase of life experience and world knowledge during those years. Approximately one third of the metaphors in Grade 9 and half of those in Grade 11/12 were reifications, which reflects the increase of 3rd order meanings in the higher grades and how they are construed as concrete meanings.

Despite the developmental increase of metaphor production over the school years, metaphors remain rare. This is true for adult language as well. Sanford (2010) claims that to make a meaningful assessment of metaphor frequency, a corpus of at least four million words is needed. While an even larger corpus would be preferred for the results of the study not to be skewed by the content of the corpus, the necessity of manually annotating the data makes a bigger corpus study unrealistic (Sanford, 2010). Seen in this light, the approximately 13,000 adjective-noun combinations, distributed over

four grades, annotated in this study are far from sufficient to carry out a study on metaphor production, and probably even less adequate for studying metonyms. It is, however, as far as I know the biggest study of metaphor and metonymy development to date. And while it is true that the data may both be skewed and insufficient in some ways, the results show a clear developmental trend in written metaphor production, which may feel intuitively self-evident, but which has not yet been shown in a systematic scientific study.

Metonyms were extremely rare in all grades and in this data set there was no indication that there was a development over the school years. The types of metonyms remained the same, i.e., EMOTIONS were described metonymically pointing to the wider context (e.g., *happy vacation*), PEOPLE in terms of contexts they belong to (*other schools*), and other conventional metonyms, such as *little* to refer to someone young and *diagnoses* to refer to illness (cf. Table 13.5). Studies by Falkum et al., (2017), Koder and Falkum, (2020), Nerlich et al., (1999), Rundblad and Annaz, (2010), Van Herwegen, Dimitriouc and Rundblad (2013), show that just as with metaphors, metonym comprehension and production are present in children as young as 2 years. When Rundblad and Annaz (2010) studied the development of metaphor and metonymy comprehension from the age of 5 into adulthood (cf. section 8.5), their results show that metaphor and metonym comprehension increased with age. However, metonym comprehension was higher at all ages, suggesting that the construal of metonymy is cognitively more basic than the construal of metaphor. I consider that the results of the study in this thesis can be interpreted in the same way, since there was a clear increase in metaphor use and complexity during the school years, while metonym type and frequency remained roughly the same.

14　Conclusion

I set out on this research journey with a great curiosity about conceptual and semantic development beyond the earliest years. The Cognitive Linguistic framework and the LOC model proved to be an excellent tool for the intricate analysis of semasiological and functional aspects of language use. The purpose of this thesis has been to gain deeper insight into the conceptual development of children and teenagers during the school years. This was investigated through the lens of lexical semantic development — more specifically, the cross-sectional pseudo-longitudinal study was designed to analyse the production of adjective and noun combinations. The data consisted of a selection of written essays produced within the scope of obligatory national tests in the subject of the Swedish language, performed in Grades 3, 5, 9, and 11/12 (i.e., students aged 8–9, 10–11, 15–16, and 17–19 years) in Swedish schools.

For the nominal meanings, the results of the study show that, with the exception of meanings to do with TIME, there is a gradual development from expressing almost exclusively concrete nominal meanings existing in time and space in the adjective and noun combinations (e.g., *sharp knife* and *big boats*) in Grade 3, to abstract meanings (e.g., *serious problem* and *professional assessment*) constituting approximately half of all nominal meanings in Grade 11/12. The biggest developmental difference occurred between Grades 9 and 11/12. However, the inspection of concrete nominal meanings showed that there is not only a development happening from concrete to abstract, but also with regard to concrete meanings. There was a development from younger students mostly expressing meanings from the domains of ARTEFACTS and ANIMALS, shifting to predominantly being about PEOPLE in the older students' texts, often expressing more complex meanings; compare for example *a cute dog* and *a naïve person*. While the overall use of figurative language remained low, the increase of abstract meanings over the school years did result in an increased use of metaphors (e.g., *broken relationships* and *golden ticket*). Many metaphors were strictly speaking reifications, i.e., abstract meanings construed as if they were concrete, as in for example *big influence*, *high risk*, and *deep meaning*.

Just like nominal domains, adjective domains were also subject to development. Content-biased adjective domains showed great variation from Grade 3, while the

representation of schematically biased domains, such as QUANTITY (e.g., *additional task*) and MATCH (*similar society*) increased steadily over the school years. As regards adjective configuration, gradable uses (e.g., *a funny way* and *mean comments*) were most common, but non-gradable uses, such as *classic comic book*, *social network* and *moral dilemma*, slowly but steadily increased at the expense of gradable uses. There was no such clear pattern for the non-scalar configuration. Of the five adjective functions, specification (e.g., *an exciting trip*, *the young author*) was the most common one in all age groups, albeit with a considerable drop in Grade 11/12, when an increase of uses in the kind-identifying function occurred (e.g., *environmentally friendly light bulbs*, *chemical pesticides*, and *global warming*). The functions of element identification, stipulation, and identity provision did not show a clear developmental pattern.

The adjective construction proved to be the aspect that was most intricately connected to all of the other adjective parameters, both semasiologically and functionally, in every instance of use. For example, adjective domain was shown to be of major relevance for adjective position — meanings from content-biased adjective domains were predominantly in predicative position, as in *he was kind* (albeit some of them showed a trend towards more attributive uses in higher grades, as in for example *a kind father*) and adjectives from schematically biased domains were predominantly in attributive position (e.g., *similar problem* and *total humiliation*). However, the function of the adjective also came into play. While specification leaves the language user with a choice between the predicative and attributive position (albeit governed by conceptual content), in the other functions the attributive position prevails. Consequently, the steady increase of attributive uses over the school years can be explained both by the increase of adjectival meanings from schematically biased domains and by the increase of adjective uses in the kind-identifying function. Another aspect interconnected with both the structure of the adjective meaning and its function is adjective configuration. When adjectives are used in the kind-identifying function, as in *classical musical*, they are always non-gradable; in the other functions, however, gradeability is motivated by the content structures of both the adjective and the noun, compare for example *a very American movie* (gradable) and *American football* (non-gradable). Scalar uses and the function of specification are most common in all grades, but with the increase of kind identification, non-gradable meanings increase as well.

In summary, the results of this study show that for each and every adjective and noun combination produced, there is an intricate interaction happening on both the semasiological and the functional level. The adjective and noun combinations evoke a number of different construals, varying according to content and context. Considering the complexity of producing adjective and noun combinations, it makes sense that the developmental path should extend over the school years. In fact, the research in this

thesis shows that there are developmental leaps in several areas, such as expressing abstract nominal meanings and using adjectives in the kind-identifying function, as late as between Grades 9 and 11/12.

One of the shortcomings of this study is that it does not include any adult data to function as control data. Another aspect to consider is that the results of a study of this kind are unavoidably affected by the content of the texts that are analysed. I see the number of different topics and the different subject matter at different ages as both a limitation and an advantage of and for the study. It would have been interesting to compare the results of this study with the same analysis performed on a more homogeneous material. Some artefacts might have been avoided, for example the heavy bias of noun meanings referring to ANIMAL and adjectives from the domain of EMOTION in Grade 3. On the other hand, the results of this study are robust despite this limitation.

At times I questioned the decision to do such a fine-grained study, but at other times it didn't seem detailed enough. Every category could have been studied on a deeper level, for example, nominal meanings could have been annotated with regard to genericness, adjective meanings could have been annotated for time-stability, and metaphors with regard to conventionality. Even the relatively large number of adjective domains felt like a compromise, not reflecting the specificity with which children and adolescents express themselves. Despite these reflections, this study is, as far as I know, the largest (in terms of data) and most multifaceted (in terms of aspects studied), there exists on this topic to date. I hope this is a unique and important contribution not only to the study of conceptual development during childhood and adolescence, but also, to some degree, to the field of linguistic meaning creation in general.

When performing this study, investigating not one but a number of different aspects of a phenomenon, every single aspect in itself seemed complicated enough for a child to learn. When, at a later stage, I went on to investigate how these aspects interact and realized how complex the interaction between the different parameters is, it was hard to grasp that these things are learnable at all. To get a clearer and more detailed picture of the conceptual and linguistic development during the school years, a lot more research is needed. For the exploration of late occurring and rarer phenomena, it would be helpful to have access to a large corpus of teenage language.

During the long process of writing this thesis, the subject matter never became tedious. I find the topic of meaning making endlessly fascinating. On so many levels, it is still a conundrum how we create language, with all its complexities, and make it work for us. Luckily, researchers with and without the help of advanced technologies are continuing to gain new insights. And luckily, there is still a lot to investigate.

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Abstract

This thesis is about the development of adjective use and meaning structures examined from a cognitive linguistic perspective. Adjectives modify nominal meanings and it is in context, in the interaction with the noun that the adjective meaning and configuration is determined. Nearly 13,000 adjective-noun combinations from texts written by Swedish students in grades 3, 5, 9, and 11/12 were analysed according to the LOC model (Ontologies and Construals in Lexical Semantics, Paradis, 2005) with regard to domains, noun ontology, adjective gradability, adjective position, and adjective function. Furthermore, the use of figurative language was studied. The results show a development from adjectives predominantly modifying concrete nouns to increasingly abstract meanings from a broad range of adjective and noun domains. The younger students use adjectives predominantly in the predicative position but there is a gradual shift towards attributive use, and attributive uses are the most common in the highest grade. Adjectives are primarily used in a descriptive function, but in the highest grade approximately one third of all adjectives are used in a classifying function. Scalar adjective construal is the most common in all grades, but the proportion of scalar uses decreases in favour of an increase in non-gradable uses. Figurative language is rare in all grades, but there is an increase in metaphorical language over the school years.